

编译者说明

由于电子工业和电影、电视事业的飞速发展,近年来我国在光学镜头设计及其加工方面取得了很大进展。成系列的各类镜头已经设计和试制出来,有些并已进入成批生产阶段。但在品种、数量和质量方面,跟世界先进水平相比,差距还是比较大。

近年来,我们收集了美、英、德、日等国从 1811 年到现在的光学镜头资料及部分国内镜头资料共 3000 多种,现挑选其中的一部分经补充整理之后,将其出版,以供我国从事光学镜头设计的人员参考。

我们准备分成“大相对孔径物镜”(第一、二册,已出),“广角物镜”(第三册,已出),“变焦距物镜”(第四册,已出),“中等视场中等孔径物镜”(第五册,已出),“日本七十年代初的部分大相对孔径物镜及部分广角物镜专集”(第六册,已出),“1978~1980 年国外部分物镜专集”(第七册),“目镜和显微物镜”(第八册),“非球面系统”(第九册),“特种镜头及其他”(第十册)等九类。每册收集的镜头数约为 100~200 个。

原资料中,大部分没有列出象差曲线图,我们均重新计算给予补上。由于原资料的光栏位置大多没有给出,我们计算时只能根据我们主观给定的光栏位置进行计算,因此相应的象差曲线图仅供参考。

本册的内容为 1978~1980 年国外部分物镜专集。

由于我们水平有限,时间仓促,力量不足,所以只能一部分一部分地整理出版,而且在整理过程中,一定存在不少缺点和错误,分类也不可能完全合理,望读者批评指正。

参加本册编译工作的有杨庭田和林茂智同志,春光、林金明等同志参加了部分工作。

编译者

VISIT...

LANZAROTE
Caliente.COM

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符号说明

1. 凡数据后有符号“*”，表示光栏位置或其值中间有光栏。

凡数据后有符号“**”，表示原资料中未给此值，此系编者在计算时给定的值。

2. 本册各镜头的数据，均以毫米为单位。

3. 常用符号：

ΣS_1 球差系数和；

ΣS_2 彗差系数和；

ΣS_3 象散系数和；

ΣS_4 场曲系数和；

ΣS_5 畸变系数和；

LA' 球差；

$\Delta H'$ 绝对畸变；

x'_t 细光束子午场曲；

x'_s 细光束弧矢场曲；

$x'_t - x'_s$ 象散；

K'_{F1} 全口径的子午彗差；

$K'_{F0.7}$ 0.707 口径的子午彗差；

QP 相对畸变；

HI 理想象高；

E. F. L 焦距；

B. F. L 后截距；

FNo. 相对孔径倒数；

F. A. 视场角；

L'_p 入瞳距离或光栏距 L'_p 下标所示面的距离；

η 物高；

ω 镜头视场。

编号: 07-00-001

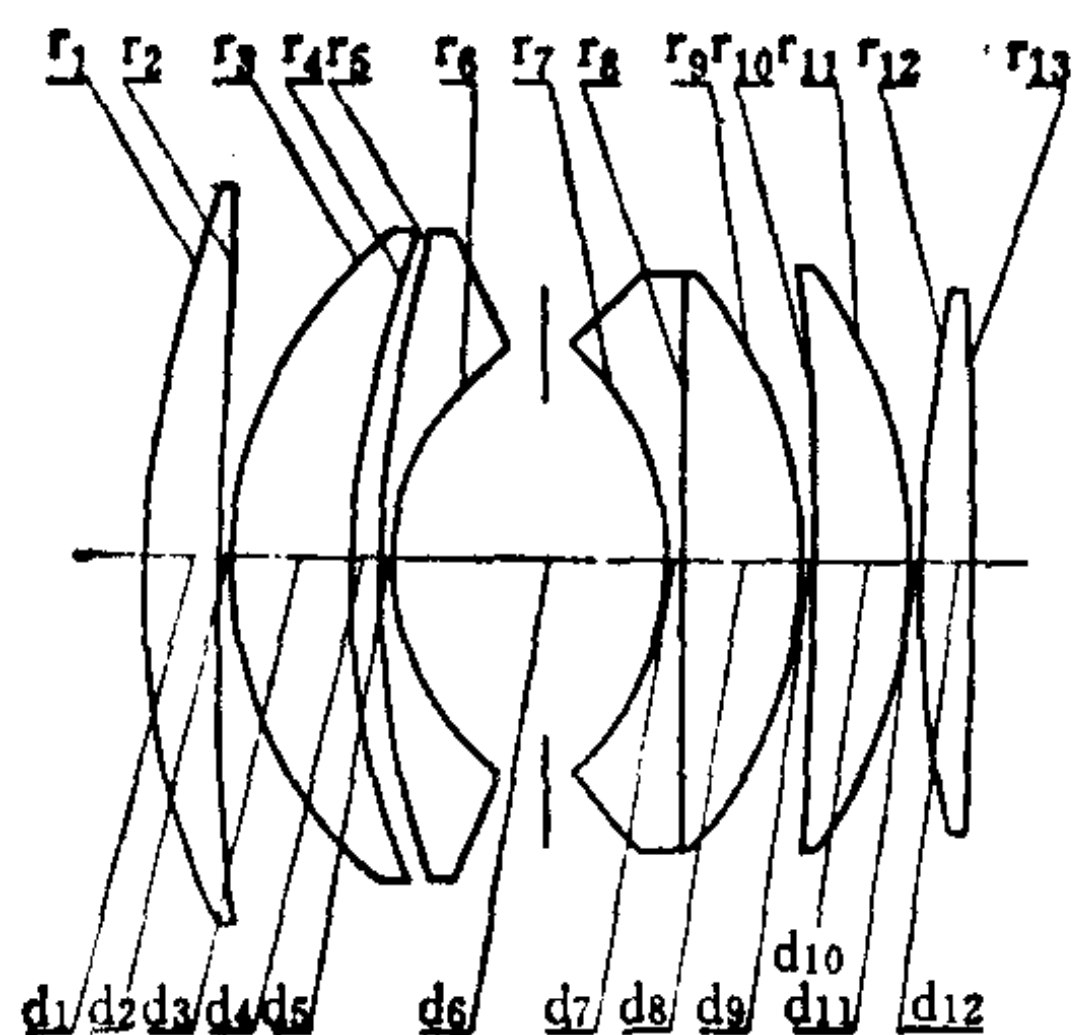
大 孔 径 照 相 物 镜

E. F. L = 100

B. F. L = 74.2

FNo. = 1.2

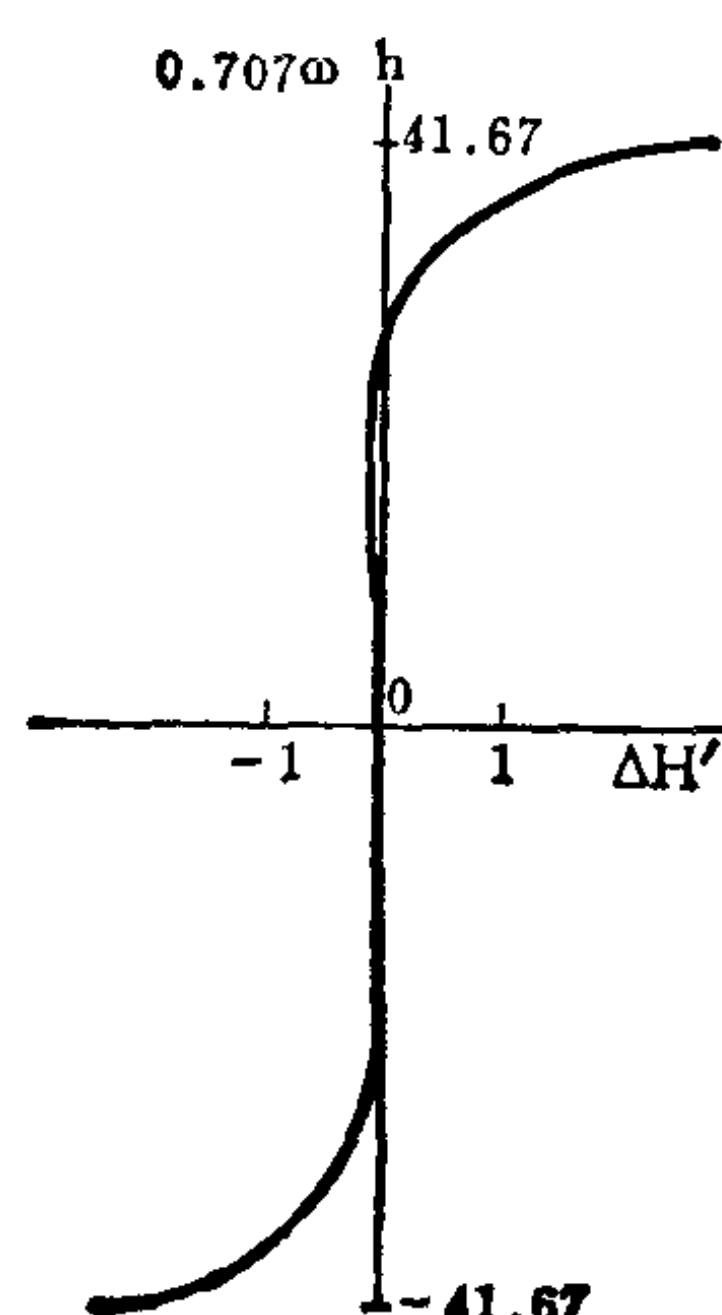
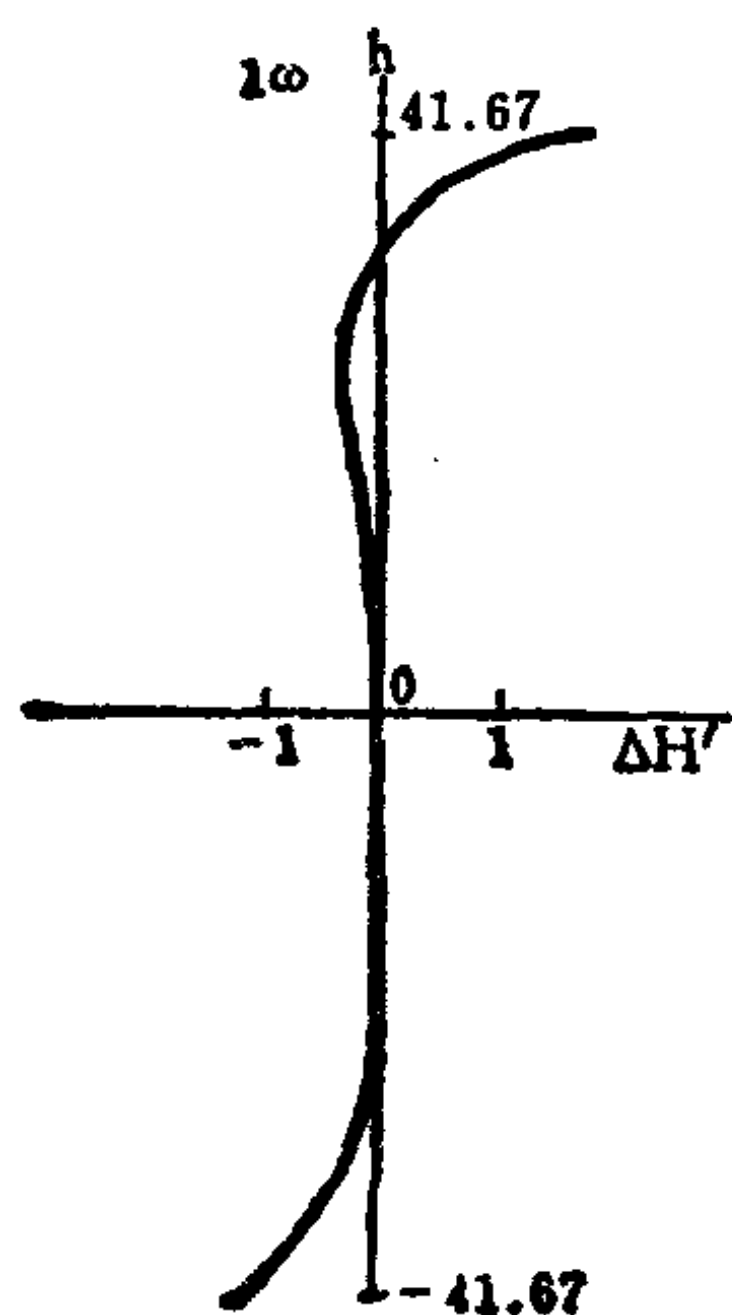
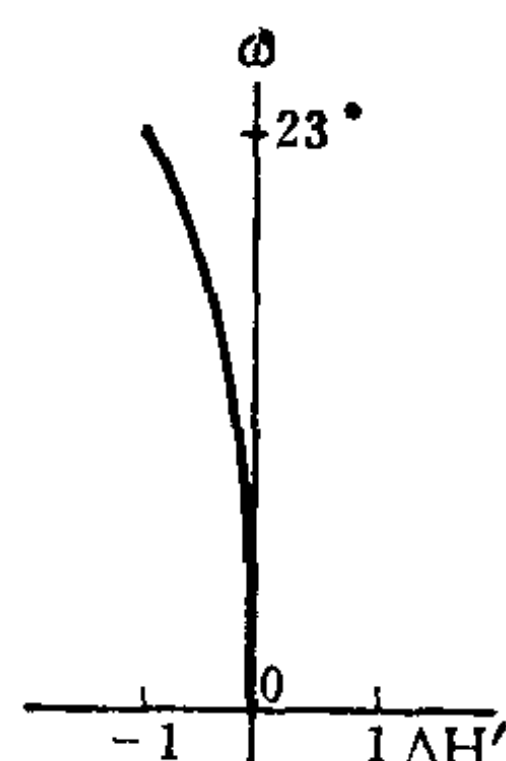
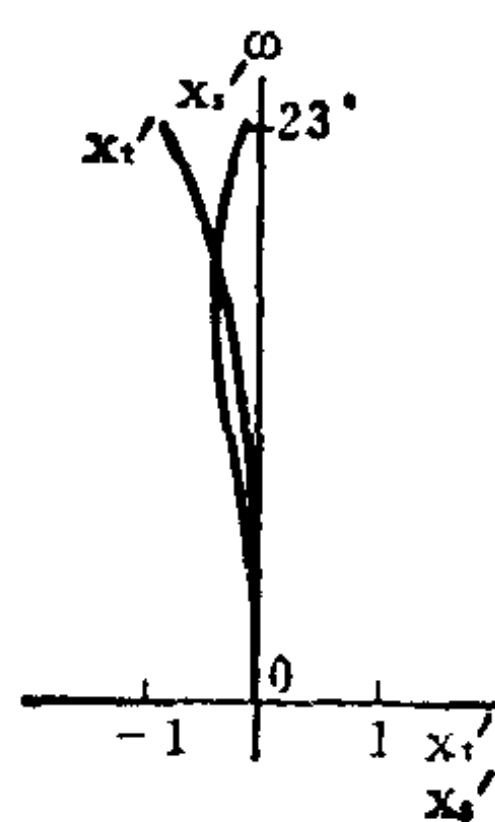
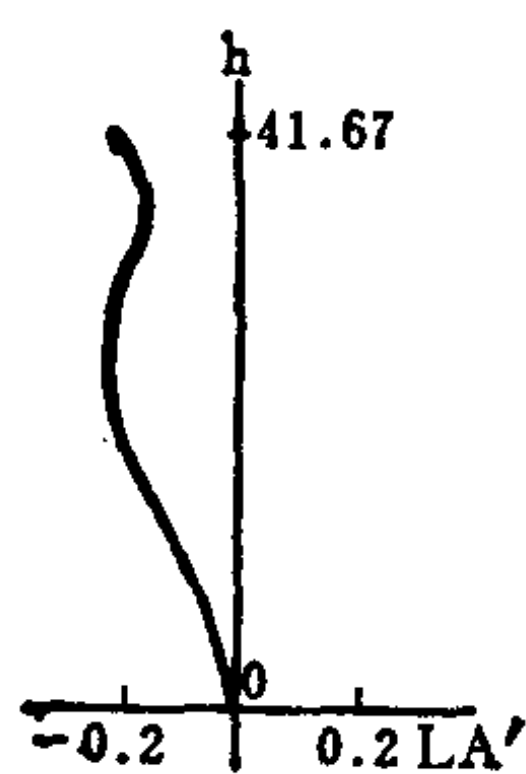
F. A. = $\pm 23^\circ$



序号	r	d	nd	vd	序号	r	d	nd	vd
1	125.969	10.85	1.79631	40.8	8	∞	16.67	1.77279	49.5
2	968.992	0.19			9	-57.171	0.19		
3	56.202	15.50	1.76684	46.6	10	-237.500	11.82	1.71300	53.9
4	115.310	2.91			11	-67.054	0.19		
5	155.039	2.91	1.68893	31.1	12	176.357	6.40	1.76684	46.6
6	35.754	34.50*			13	-416.759			
7	-35.601	2.13	1.75520	27.5					

34.50* = 17.25 + 17.25

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.3860	0.0232	0.0883	-0.4609	-0.7805	42.4	-2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.214	-0.875	-0.852	-0.116	-0.736	0.2393	-0.2012
70	-0.225	-0.352	-0.283	-0.337	0.054	0.2777	-0.0355



编号: 07-00-002

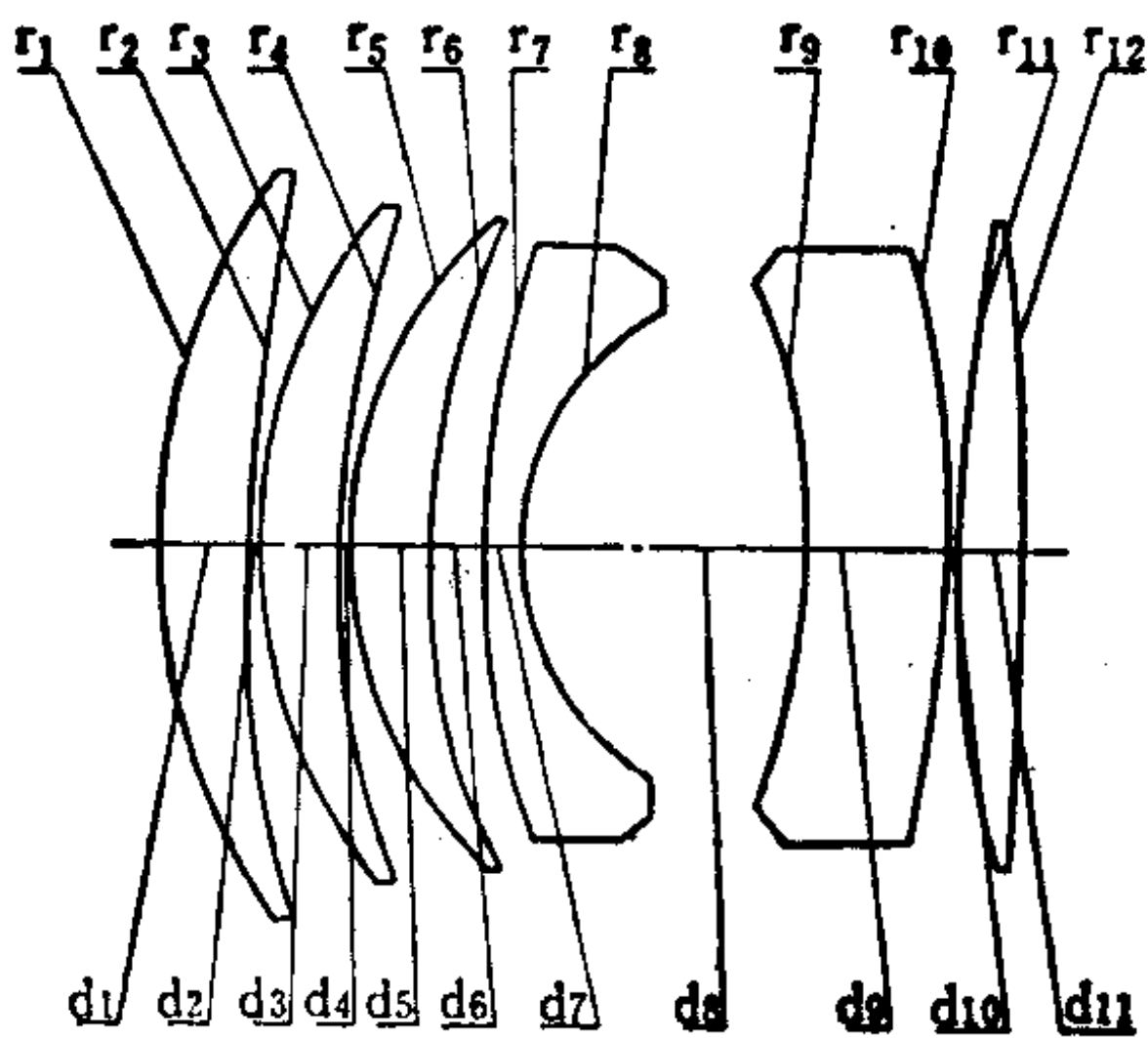
大口径远摄物镜

E. F. L = 100

B. F. L = 39.9

FNo. = 2

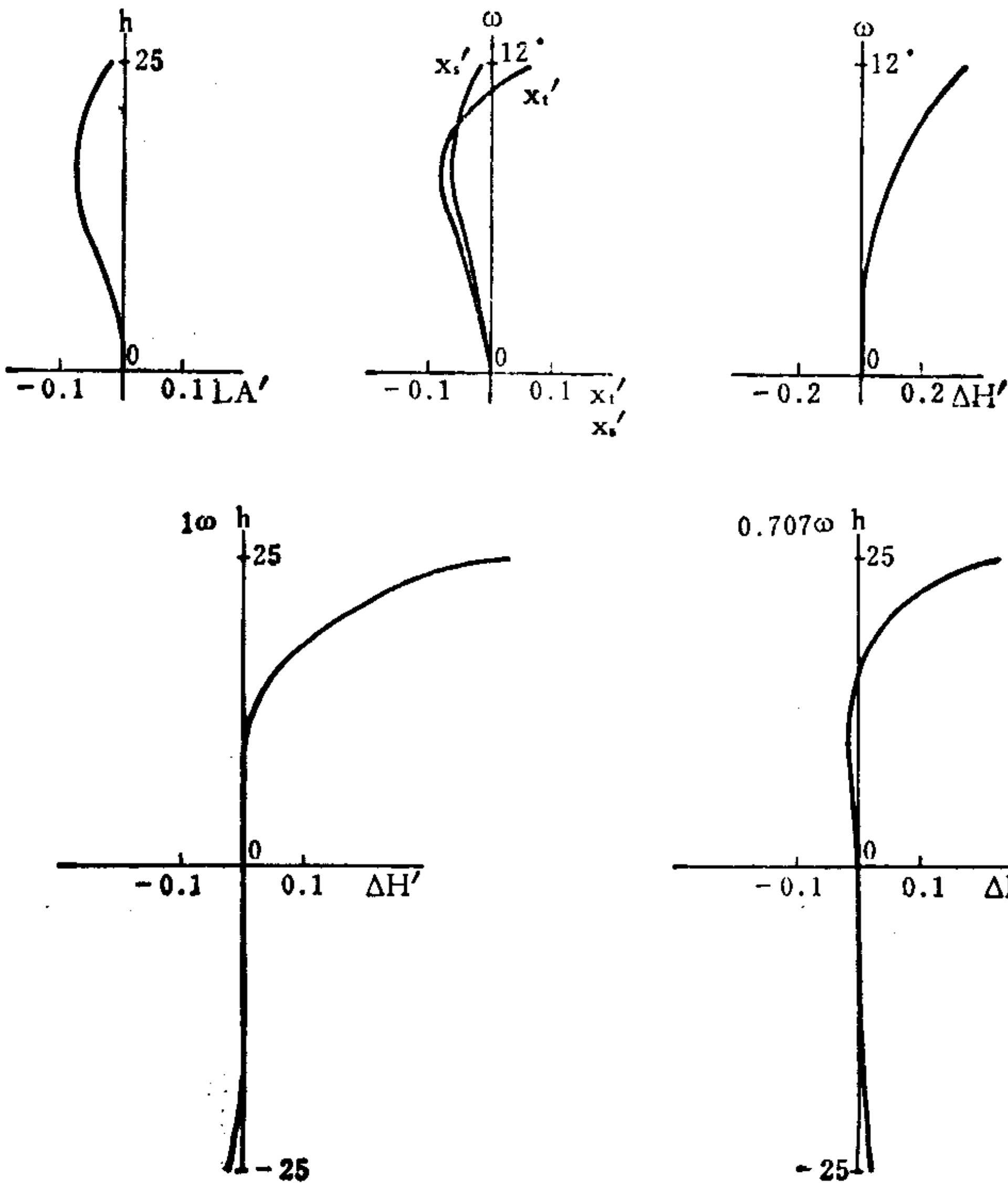
F. A. = $\pm 12^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	41.623	7.00	1.62041	60.27	7	70.094	2.20	1.78472	25.71
2	119.125	0.16			8	18.224	20.00*		
3	36.340	5.50	1.62230	53.20	9	-44.400	9.49	1.64769	33.80
4	68.521	0.16			10	-74.931	0.20		
5	30.050	5.00	1.62041	60.27	11	100.258	3.51	1.75520	27.51
6	49.039	3.78			12	-216.912			

20.00* = 10.00 + 10.00

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.0469	-0.0091	-0.0087	-0.0185	0.1913	21.2	1.5%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.0240	0.333	0.0525	-0.0233	0.0758	0.2090	0.0379
70	-0.0807	0.129	-0.0829	-0.0660	-0.0169	0.1306	0.0125



编号: 07-00-003

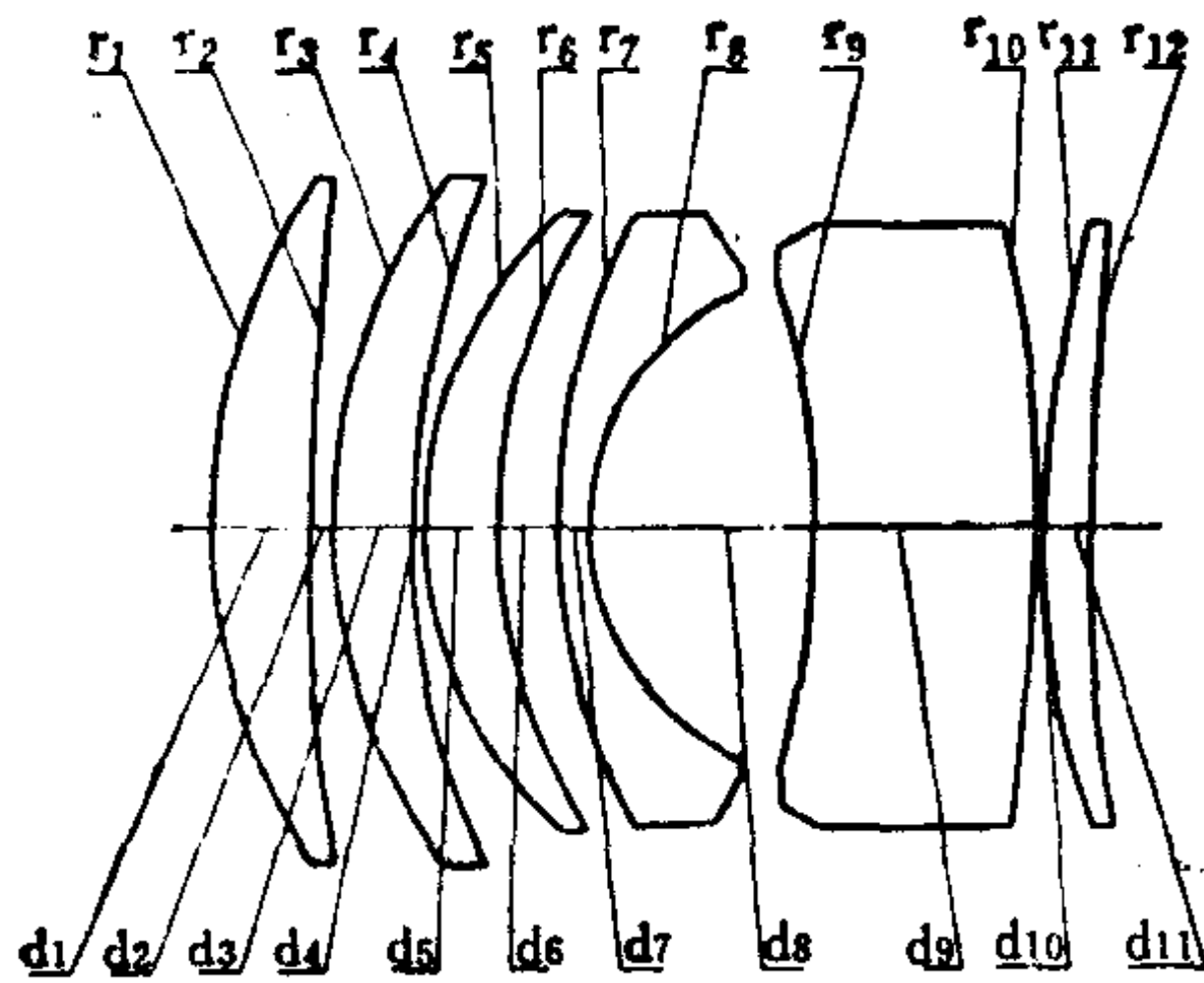
大 孔 径 远 摄 物 镜

E. F. L = 100

B. F. L = 40.6

FNo. = 2

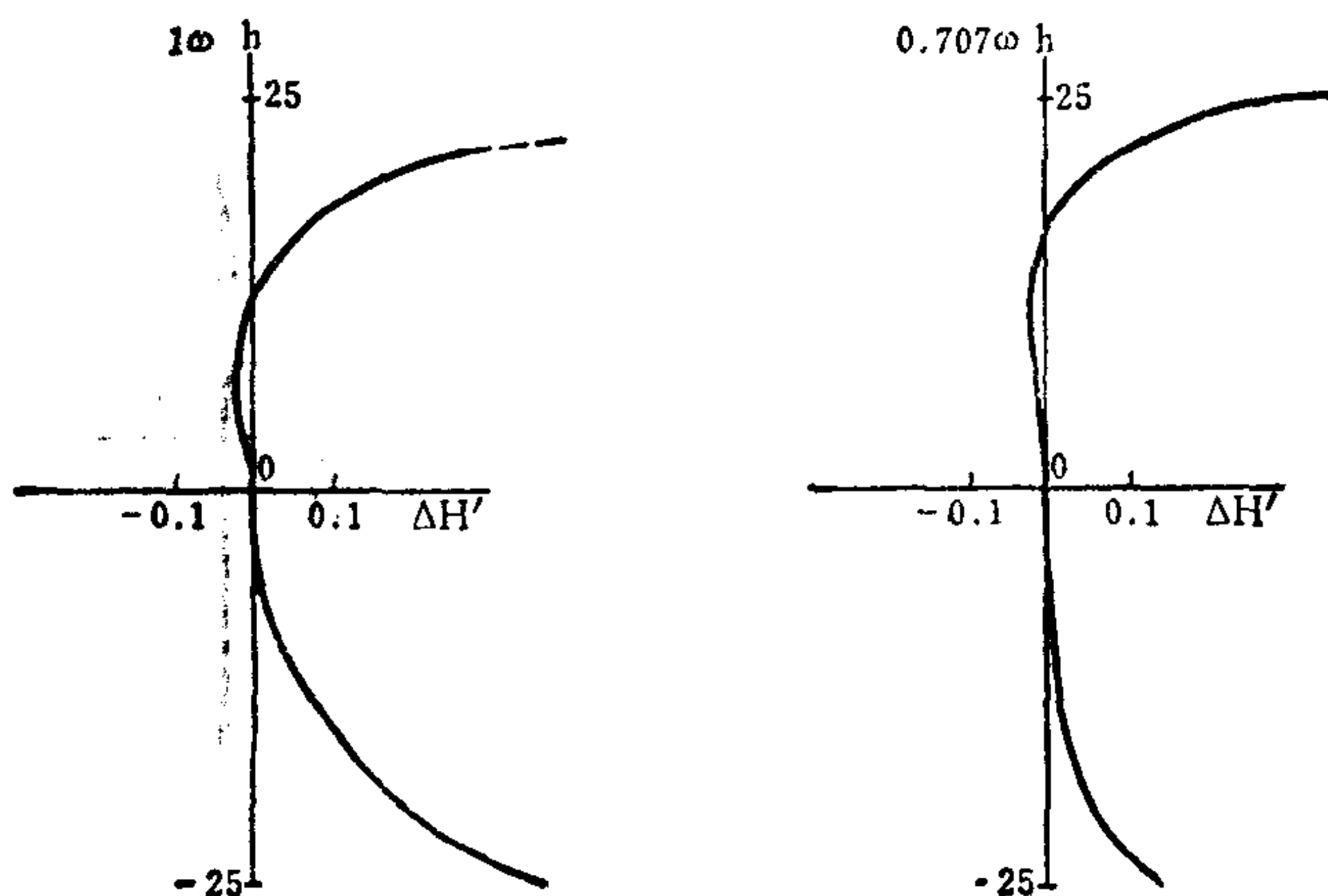
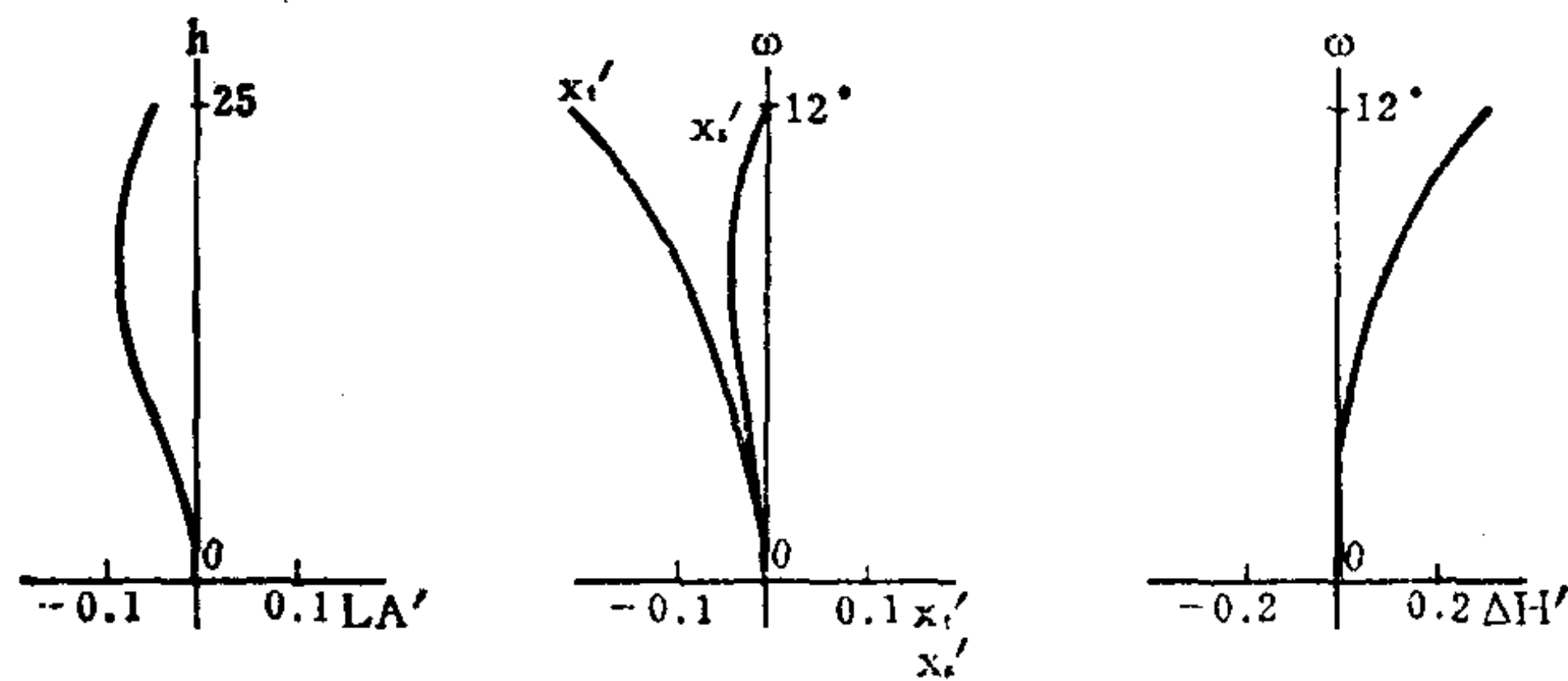
F. A. = $\pm 12^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	43.669	7.00	1.61800	64.51	7	43.640	2.20	1.78472	25.71
2	148.833	0.16			8	17.212	15.00*		
3	37.683	5.50	1.62041	60.27	9	-56.712	14.50	1.64769	33.80
4	56.374	0.16			10	-125.053	0.20		
5	25.842	5.00	1.62041	60.27	11	75.814	3.50	1.75520	27.51
6	37.998	3.78			12	1352.567			

15.00* = 7.50 + 7.50

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.0493	-0.0430	-0.0043	-0.0104	0.1816	21.2	1.5%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.0483	0.318	-0.2080	0.0016	-0.2096	0.5525	0.1227
70	-0.0806	0.123	-0.1037	-0.0355	-0.0682	0.2616	0.0187



编号: 07-00-004

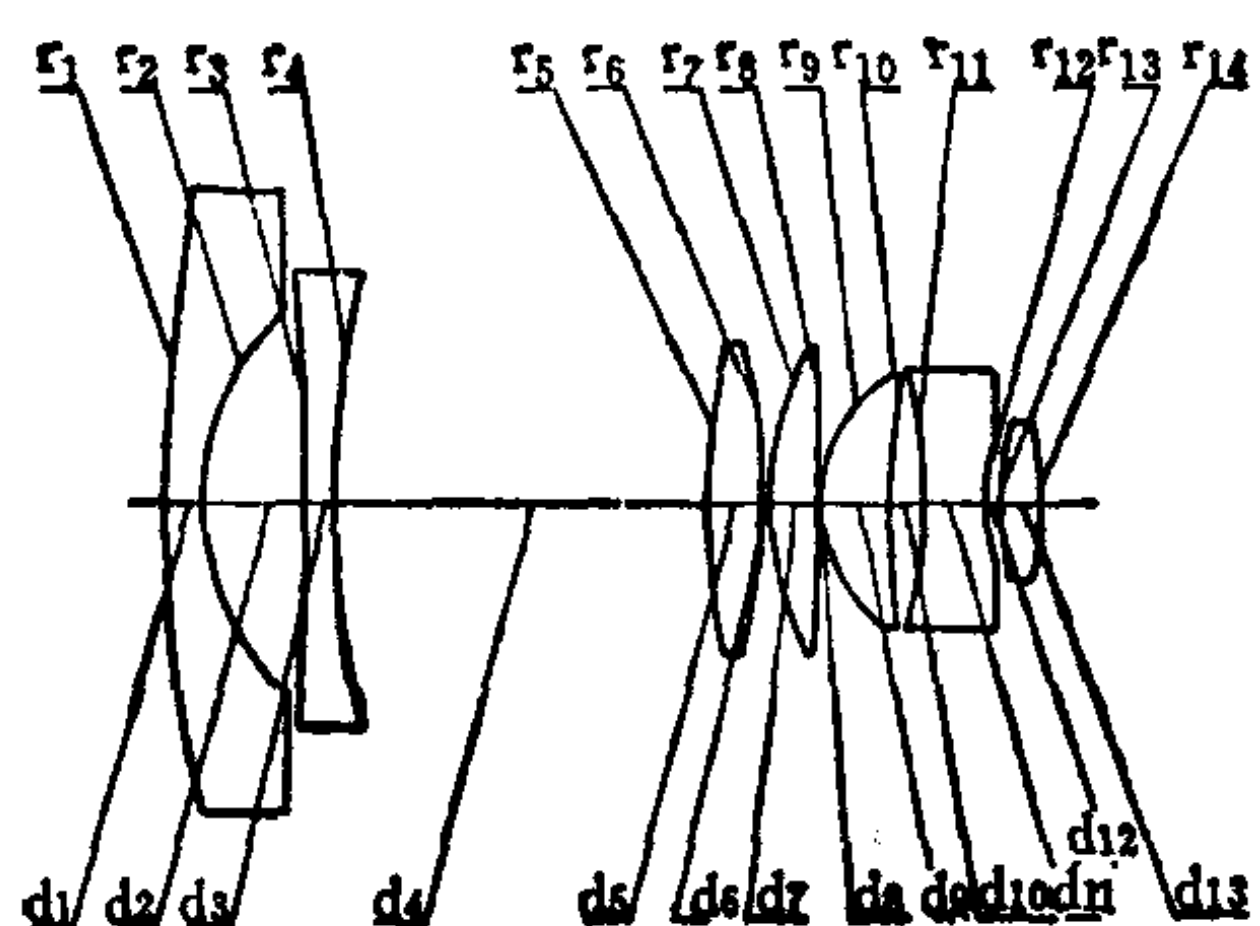
反 远 距 物 镜

E. F. L = 1

B. F. L = 0.84

FNo. = 1.6

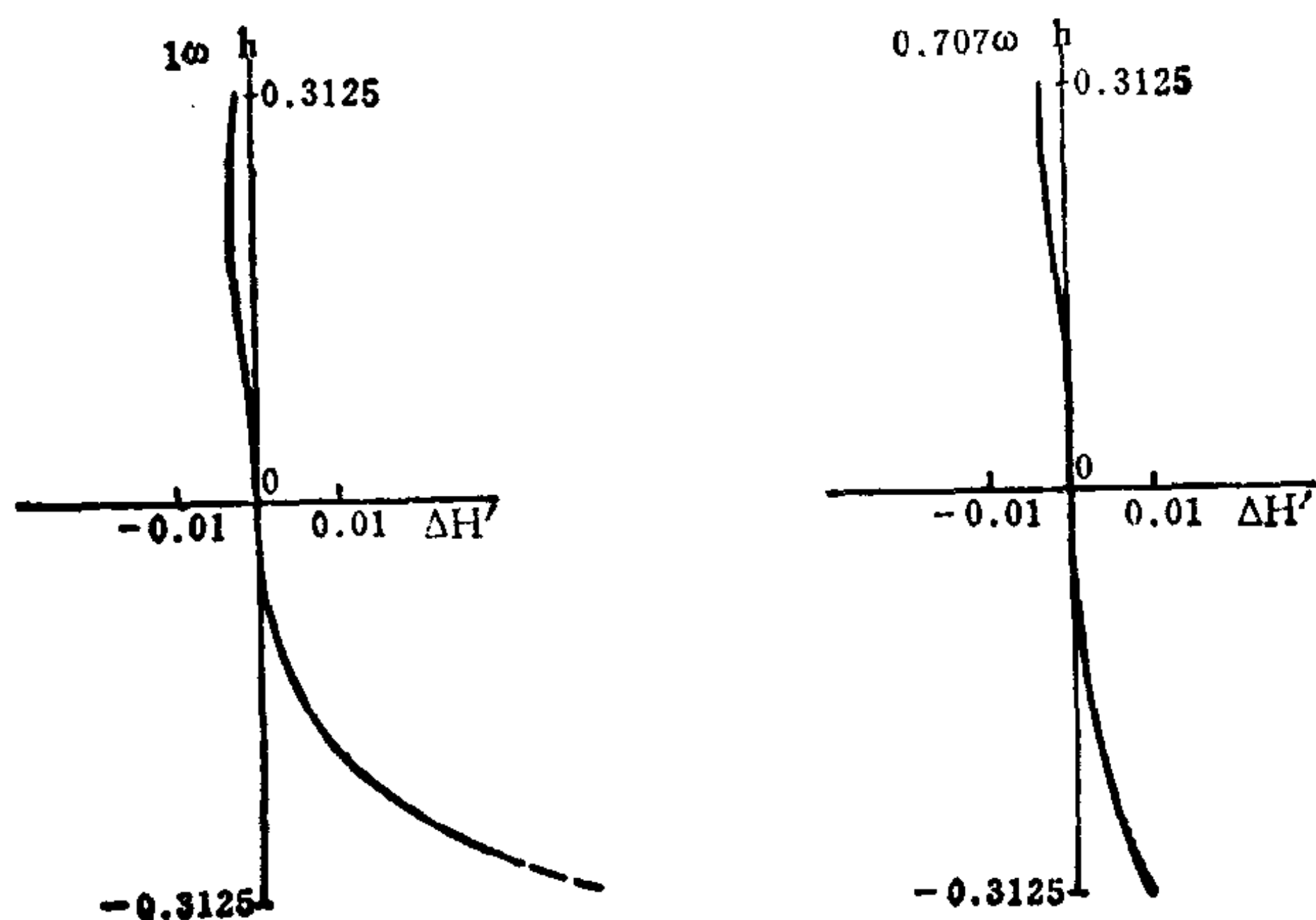
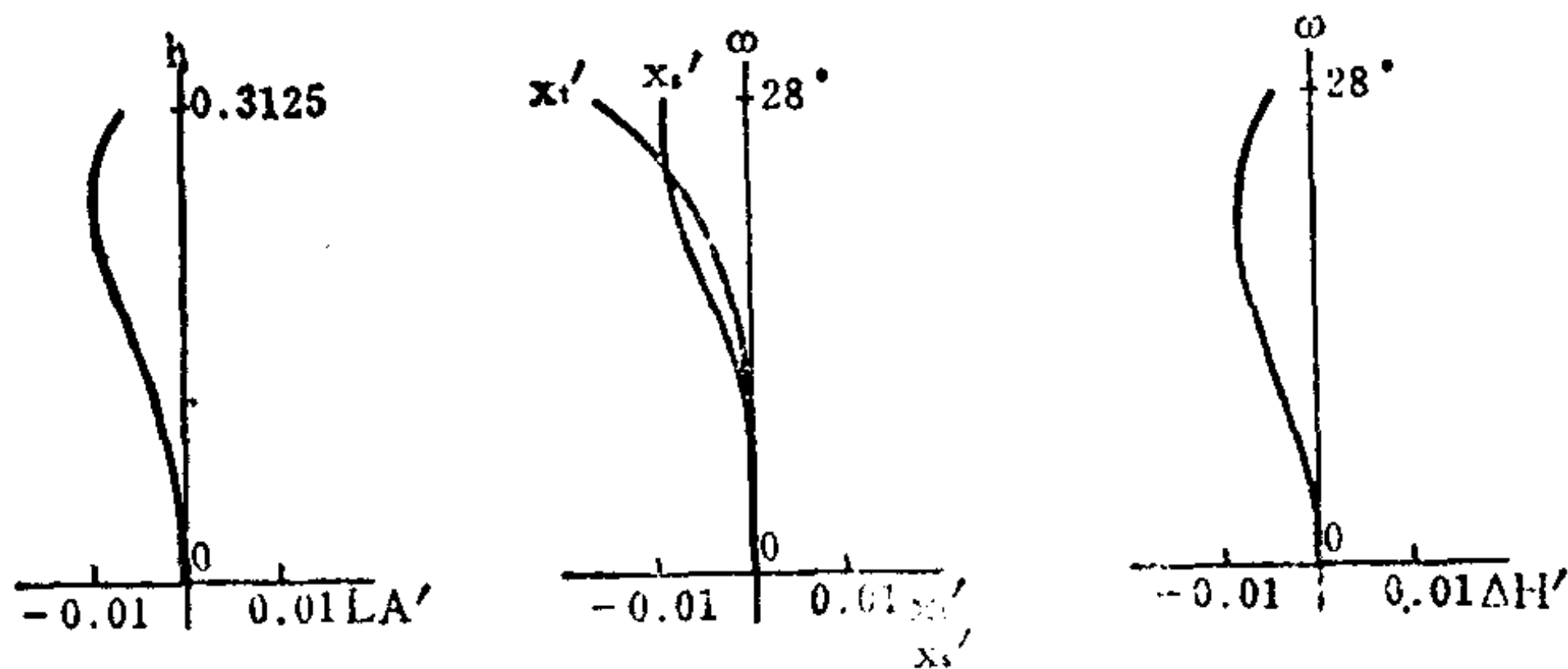
F. A. = $\pm 28^\circ$



序号	r	d	n_d	v_d	序号	r	d	n_d	v_d
1	10.650	0.215	1.487	70.4	8	-24.784	0.015		
2	1.689	0.615			9	0.988	0.446	1.504	66.9
3	-20.951	0.169	1.518	65.1	10	13.517	0.108		
4	6.461	2.415			11	-4.626	0.431	1.785	26.1
5	4.541	0.323	1.518	65.1	12	0.668	0.154*		
6	-4.541	0.015			13	2.587	0.277	1.658	57.3
7	2.548	0.262	1.620	60.3	14	-1.093			

$$0.154^* = 0.104 + 0.050$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.00461	-0.00018	0.00046	-0.00347	-0.00168	0.53	-0.07%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00641	-0.00039	-0.0157	-0.0089	-0.0068	0.03	0.00563
70	-0.00878	-0.00078	-0.0039	-0.0066	0.0027	0.00303	0.00065



编号: 07-00-005

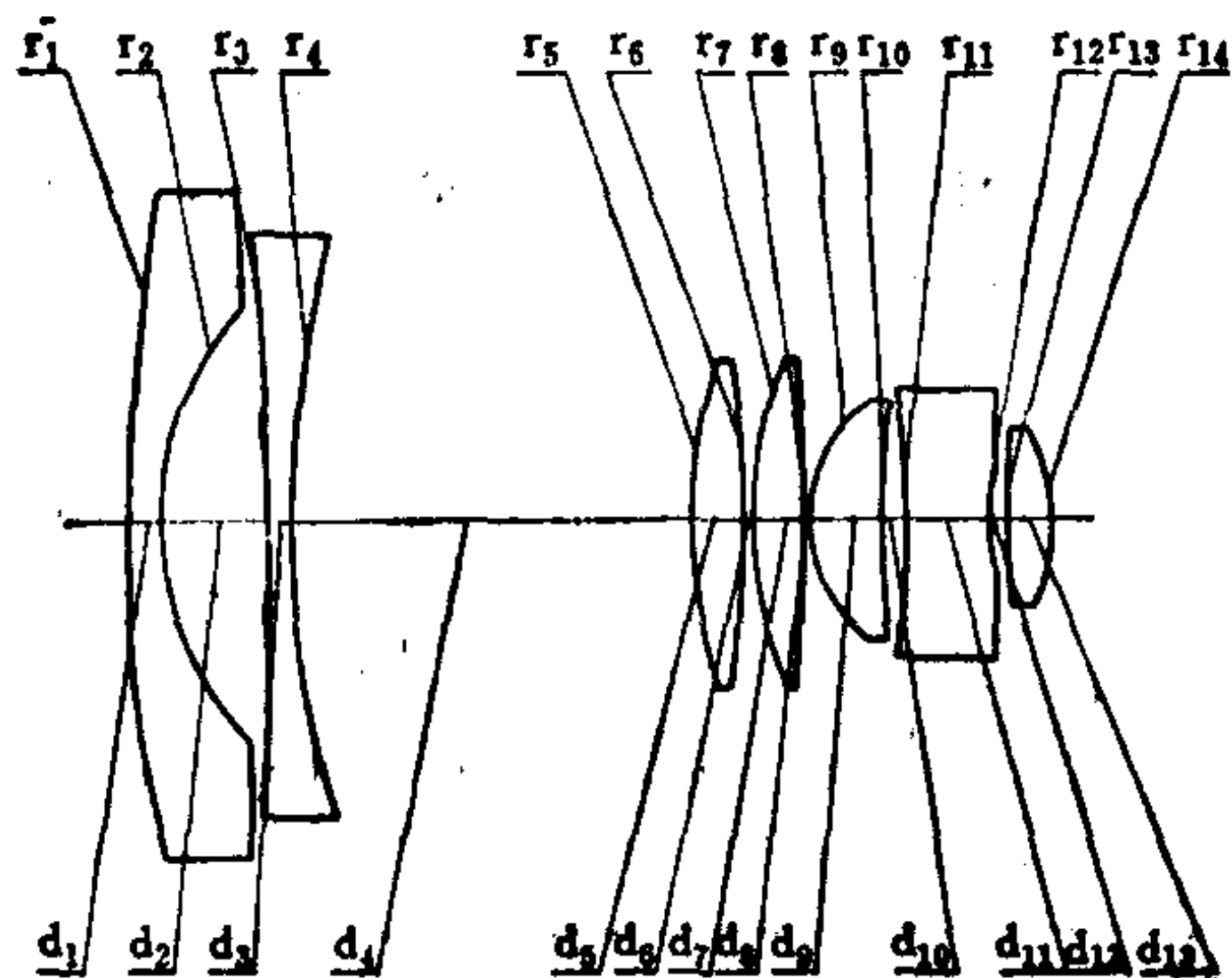
反 远 距 物 镜

E. F. L = 1

B. F. L = 0.75

FNo. = 1.6

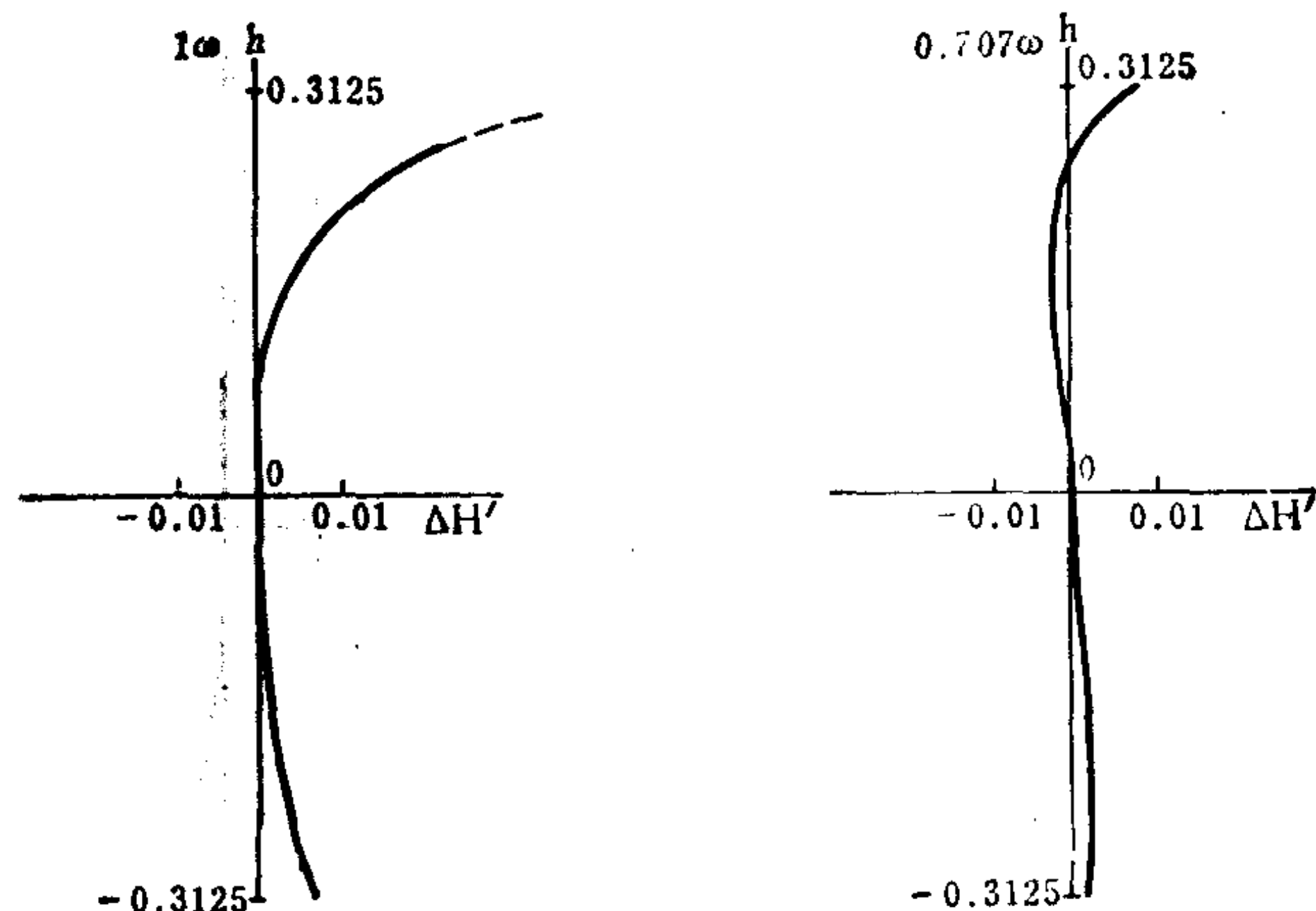
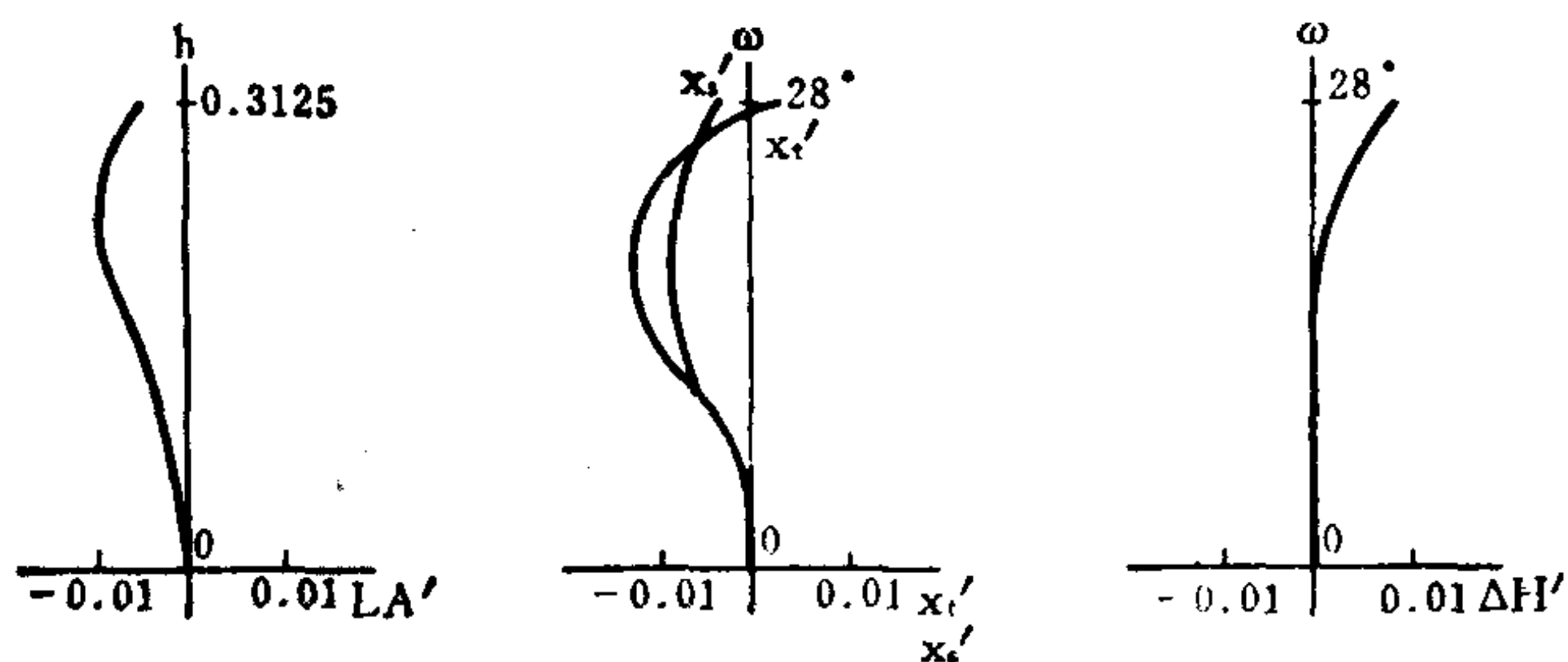
F. A. = $\pm 28^\circ$



序号	r	d	n _d	v _d	序号	r	d	n _d	v _d
1	10.853	0.221	1.487	70.4	8	-31.964	0.014		
2	1.848	0.614			9	0.908	0.441	1.504	66.9
3	-14.482	0.166	1.518	65.1	10	11.682	0.110*		
4	6.463	2.414			11	-5.071	0.428	1.785	26.1
5	4.541	0.317	1.518	65.1	12	0.611	0.152		
6	-4.541	0.014			13	2.448	0.276	1.678	55.2
7	2.547	0.262	1.620	60.3	14	-1.115			

0.110* = 0.055 + 0.055

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.00441	-0.00356	-0.00207	-0.00324	-0.00094	0.53	1.4%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00450	0.0076	0.00349	-0.00274	0.00623	0.02763	0.00675
70	-0.00790	0.0012	-0.01184	-0.00813	-0.00371	0.00495	-0.00074



编号: 07-00-006

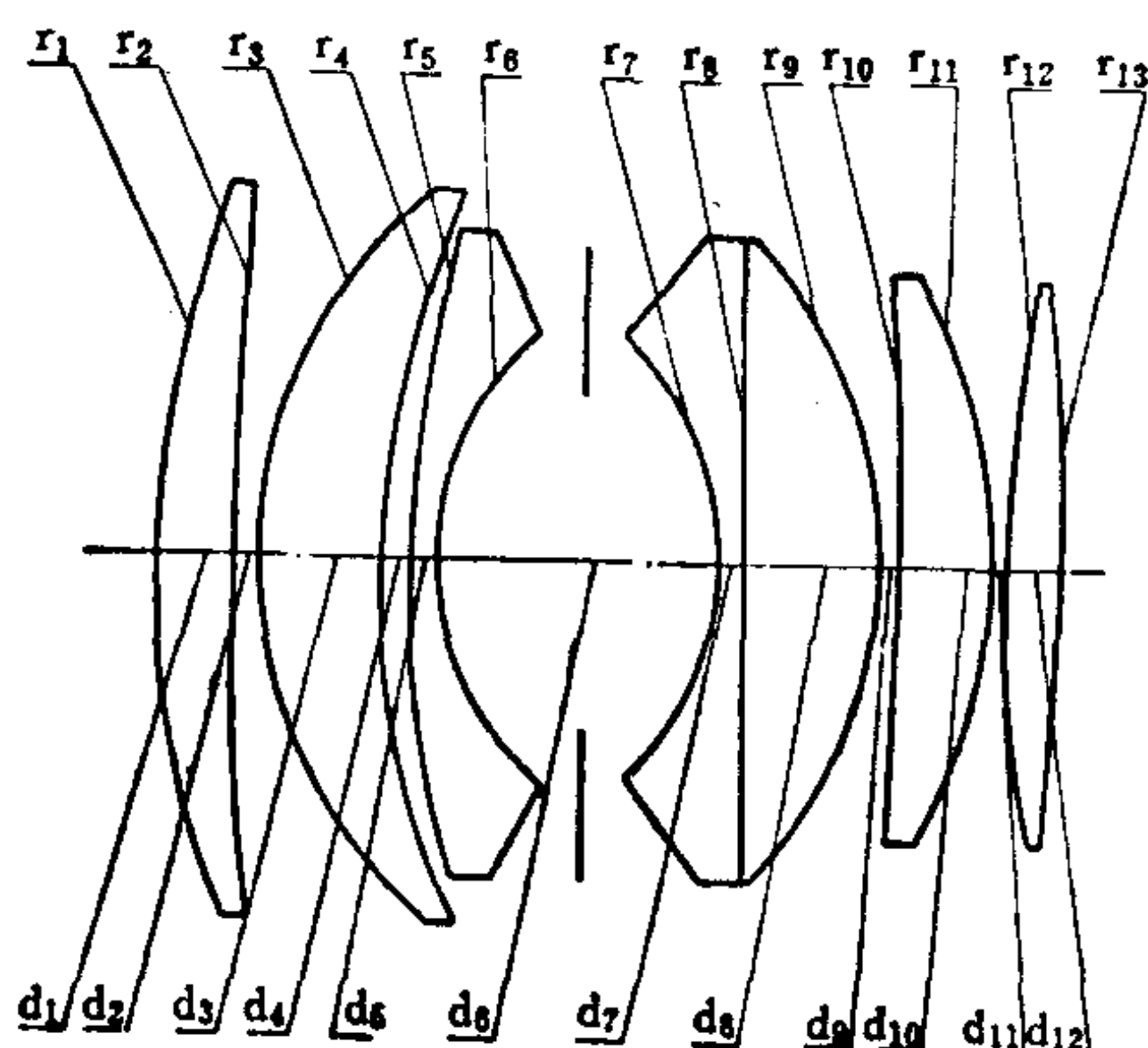
大 孔 径 照 相 物 镜

E. F. L = 100.2

B. F. L = 75.57

FNo. = 1.2

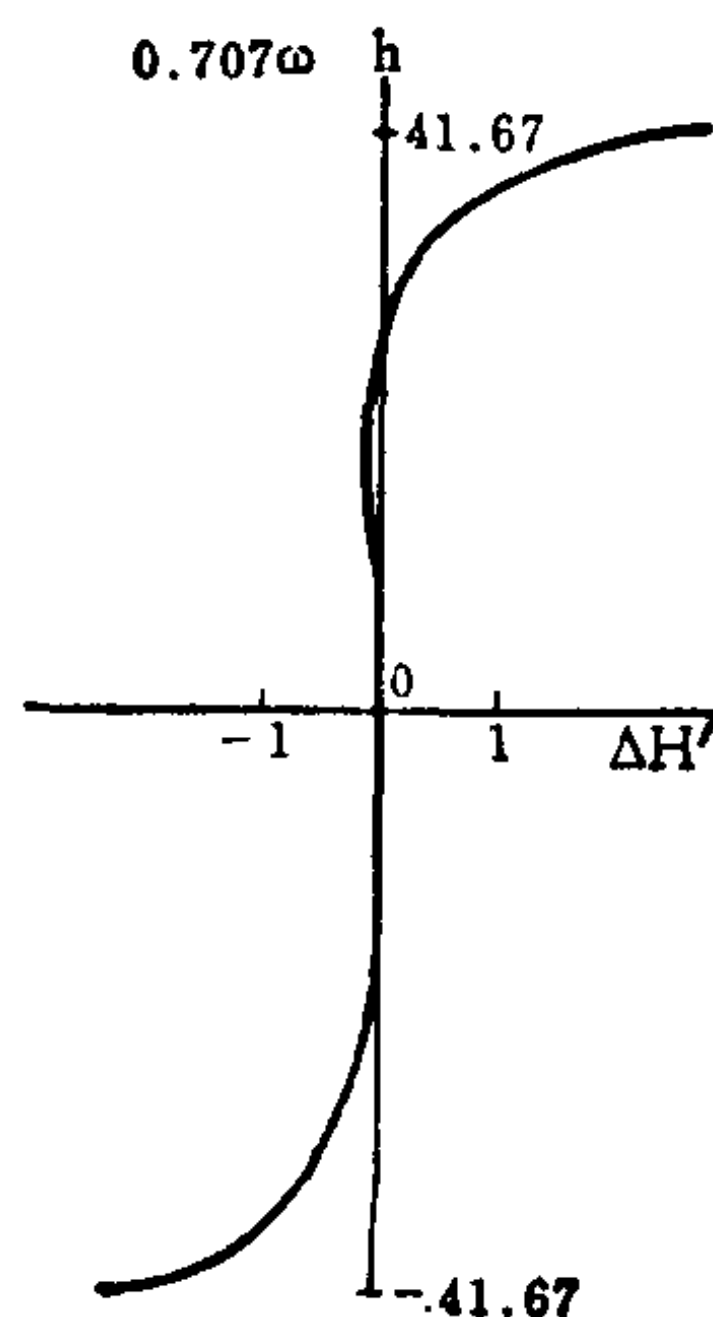
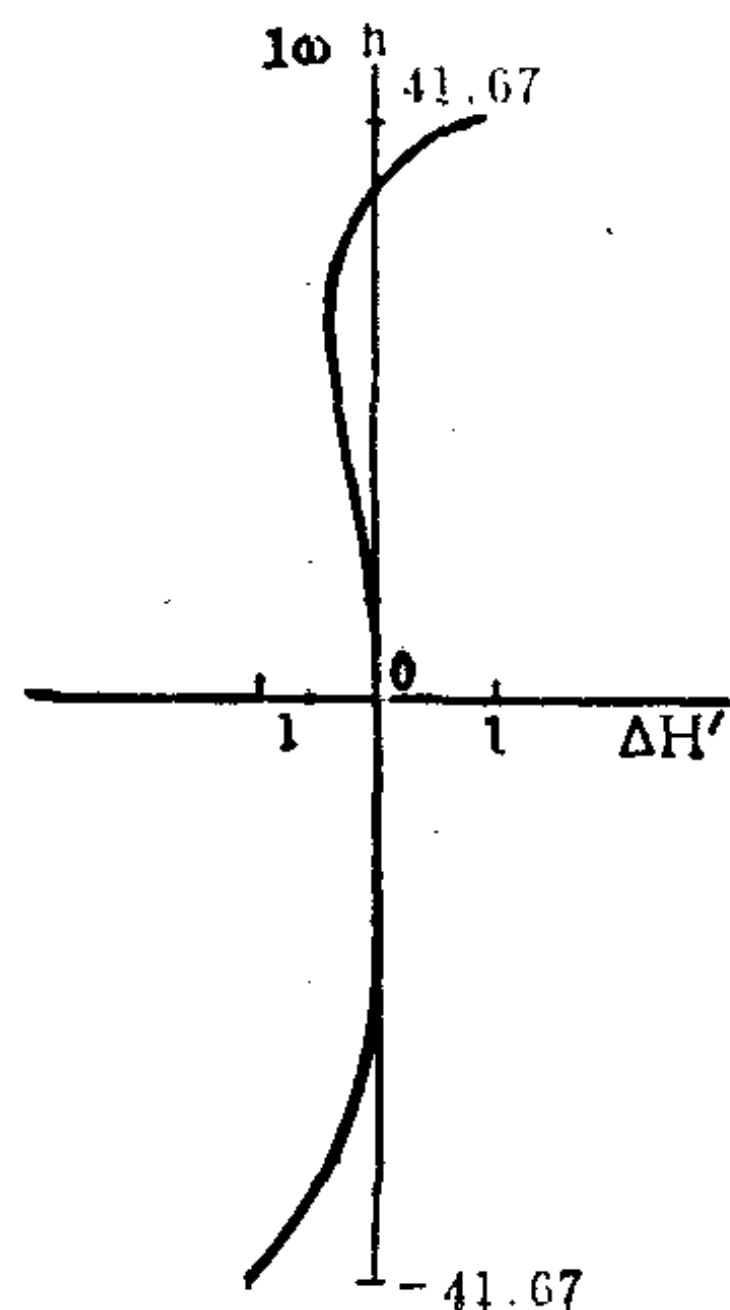
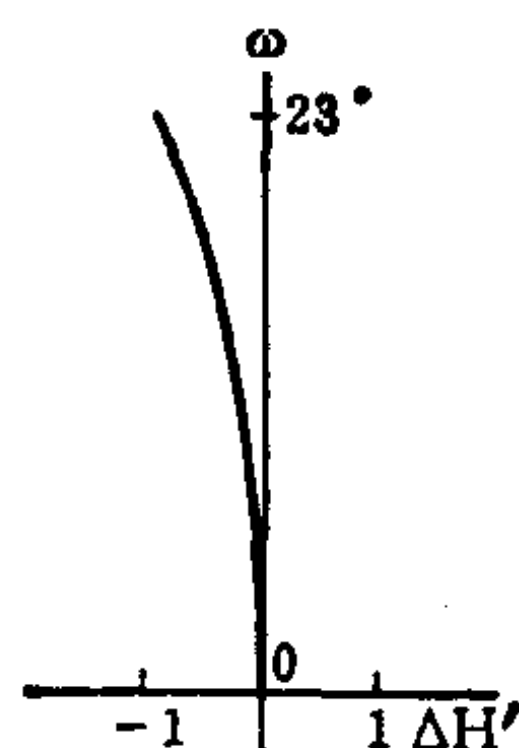
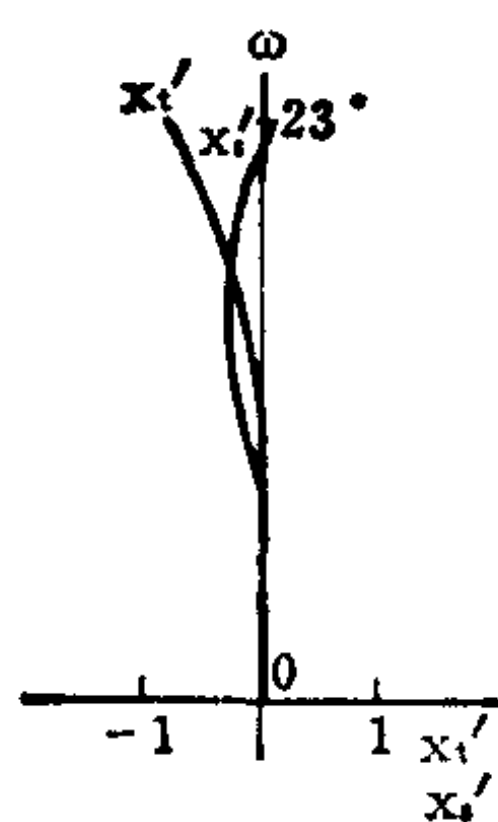
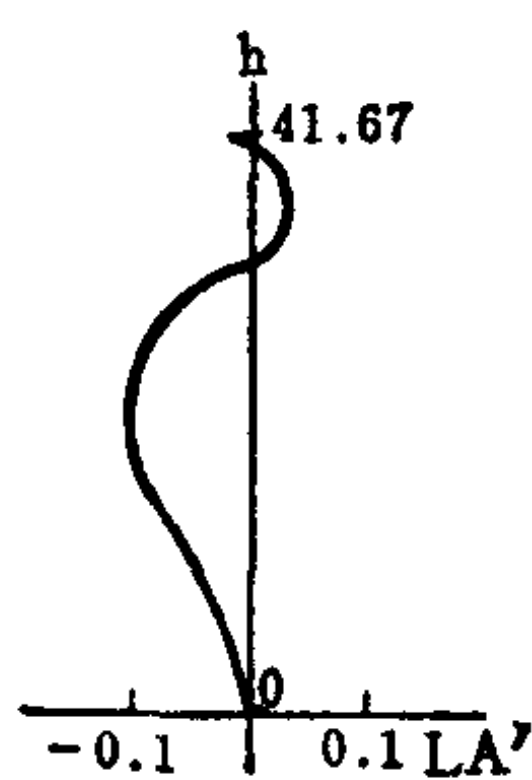
F. A. = $\pm 23^\circ$



序号	r	d	n _d	v _d	序号	r	d	n _d	v _d
1	129.845	10.80	1.79631	40.8	8	∞	16.86	1.74443	49.4
2	1490.891	0.19			9	-55.039	0.19		
3	55.233	16.09	1.74400	44.9	10	-348.837	11.82	1.72000	50.2
4	116.279	2.91			11	-67.248	0.19		
5	168.605	2.91	1.68893	31.1	12	178.566	6.20	1.76684	46.6
6	35.252	34.50*			13	-503.465			
7	-35.271	2.13	1.78470	26.1					

34.50* = 17.25 + 17.25

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.2742	-0.0282	0.1267	-0.4307	-0.8312	42.56	-2.1%
h 或 ω %	LA'	$\Delta H'$	x'_i	x'_s	$x'_i - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.0268	-0.890	-0.833	0.066	-0.899	-0.0339	-0.2861
70	-0.0680	-0.367	-0.157	-0.247	0.090	0.2710	-0.0947



编号: 07-00-007

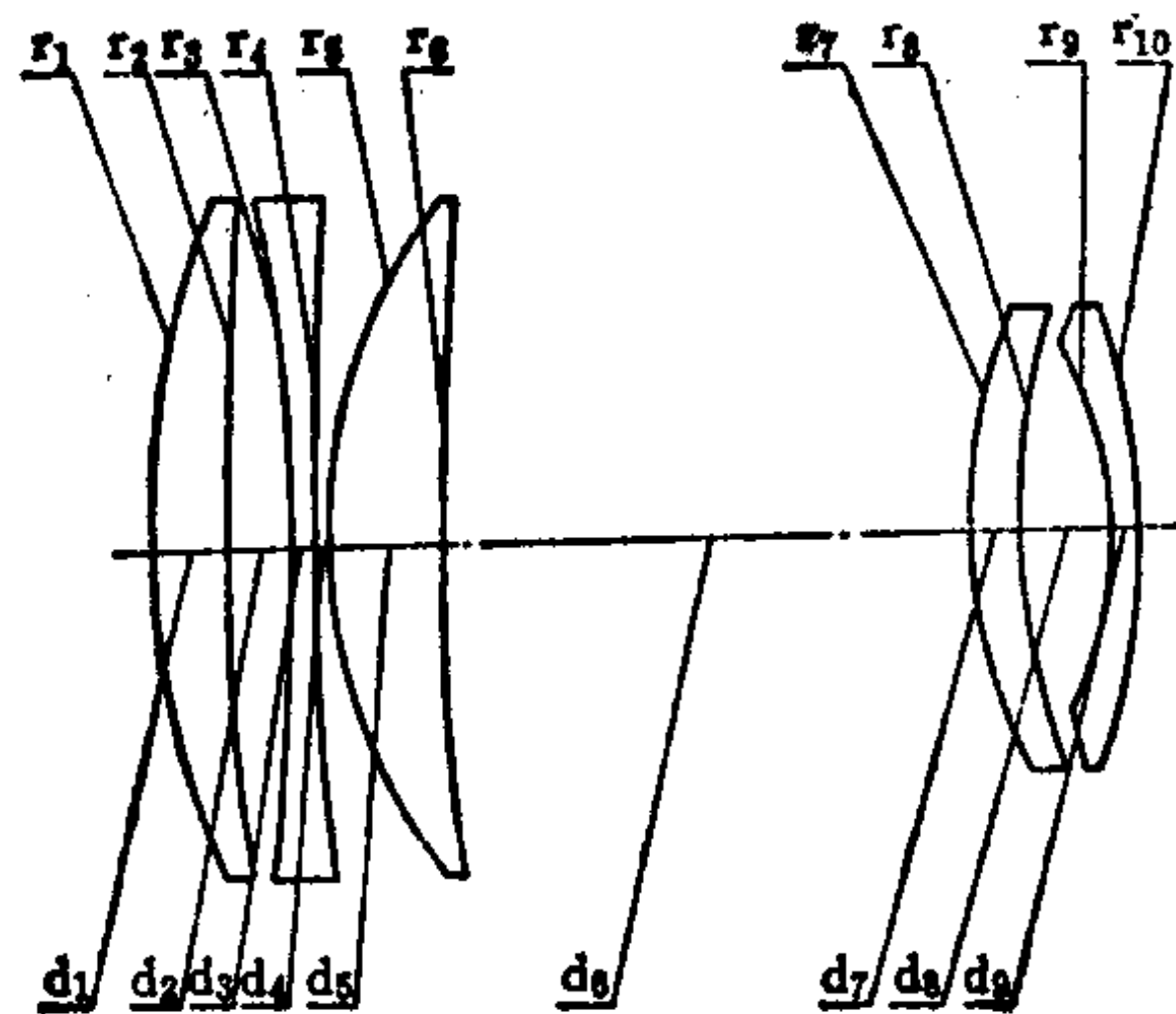
小型远摄物镜

E. F. L = 99.2

B. F. L = 35.2

FNo. = 2.8

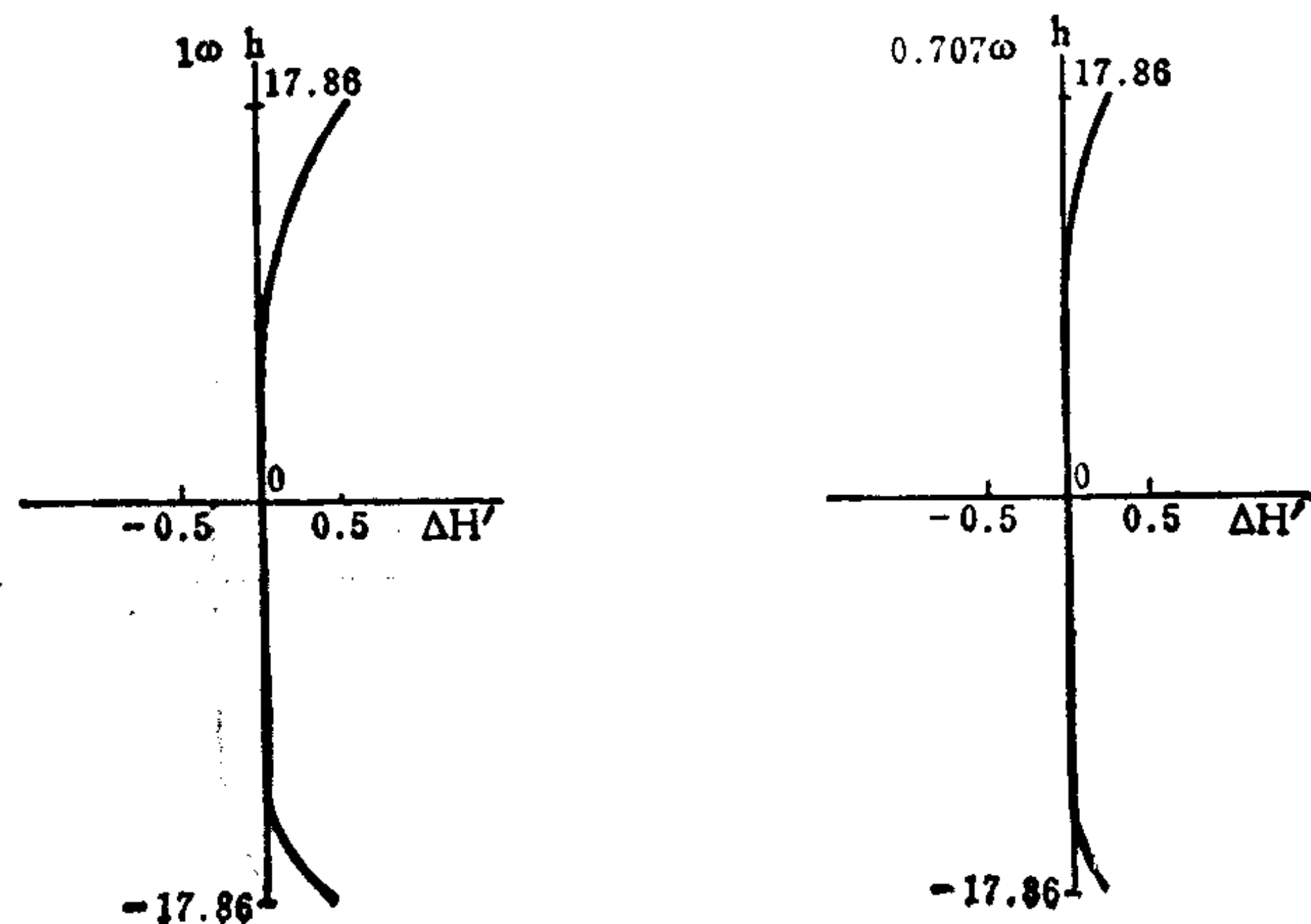
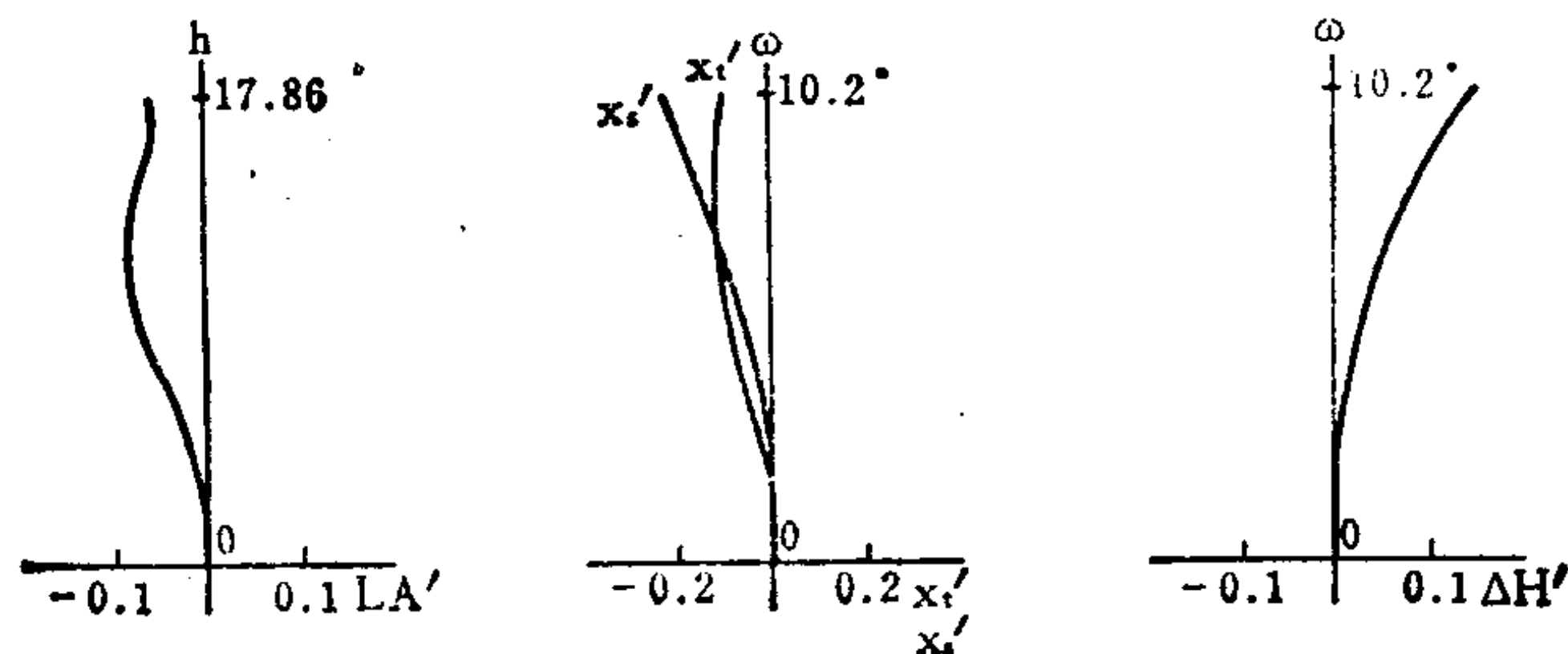
F. A. = $\pm 10.2^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	38.98	4.86	1.51821	65.0	6	134.14	28.84*		
2	145.48	3.19			7	30.61	2.88	1.80518	25.4
3	-112.72	1.68	1.80518	25.4	8	53.93	4.86		
4	209.73	0.08			9	-20.54	1.26	1.80610	40.9
5	30.94	5.81	1.55963	61.2	10	-56.03			

$$28.84^* = 14.42 + 14.42$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.02295	-0.01189	-0.00216	-0.01786	0.06655	17.8	0.8%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.0559	0.153	-0.103	-0.215	0.112	0.5071	0.0935
70	-0.0798	0.060	-0.117	-0.133	0.016	0.2090	0.0208



编号: 07-00-008

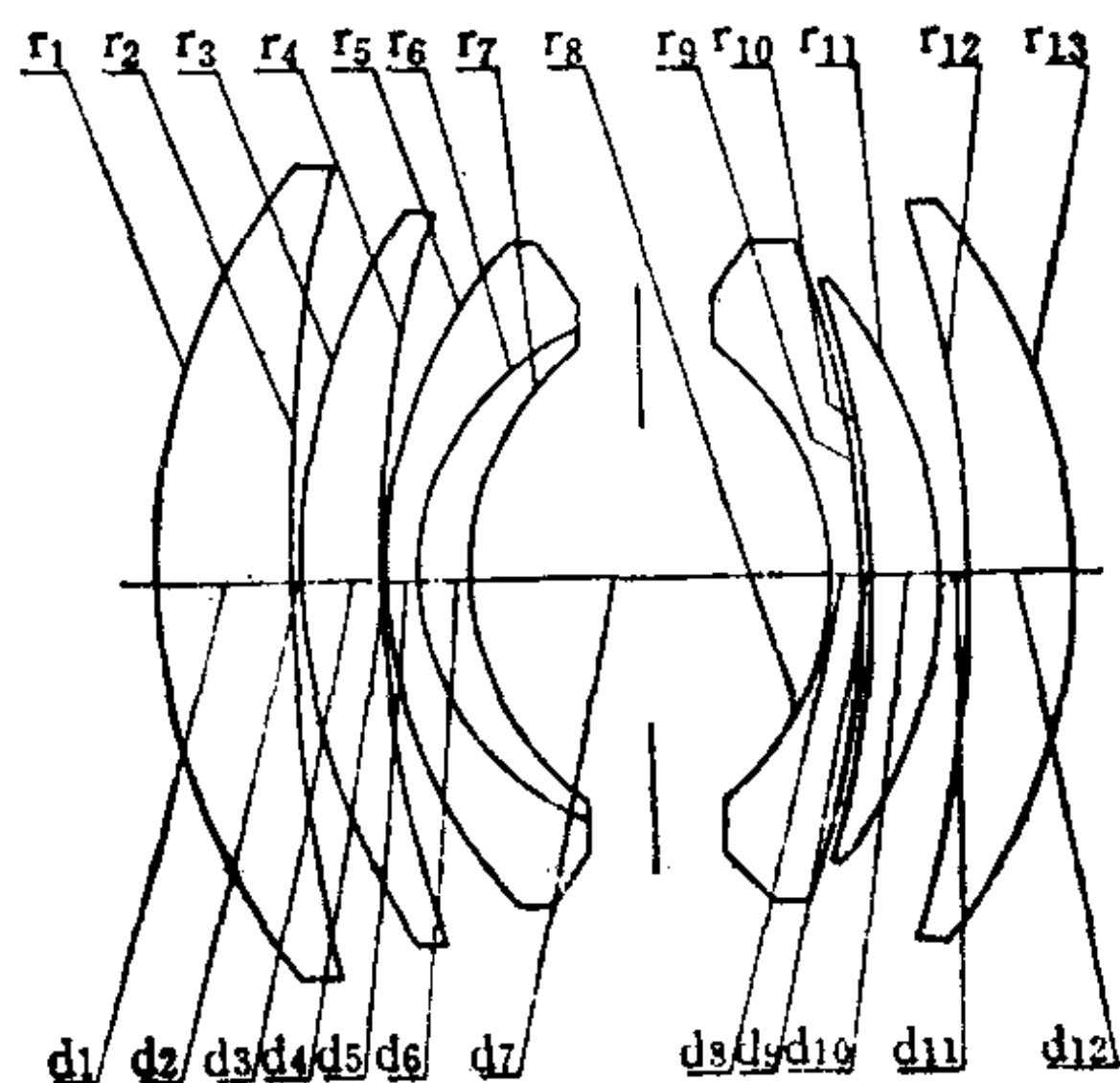
高斯型放大制版物镜

E. F. L = 100

B. F. L = 54

FNo. = 2

F. A. = $\pm 25^\circ$



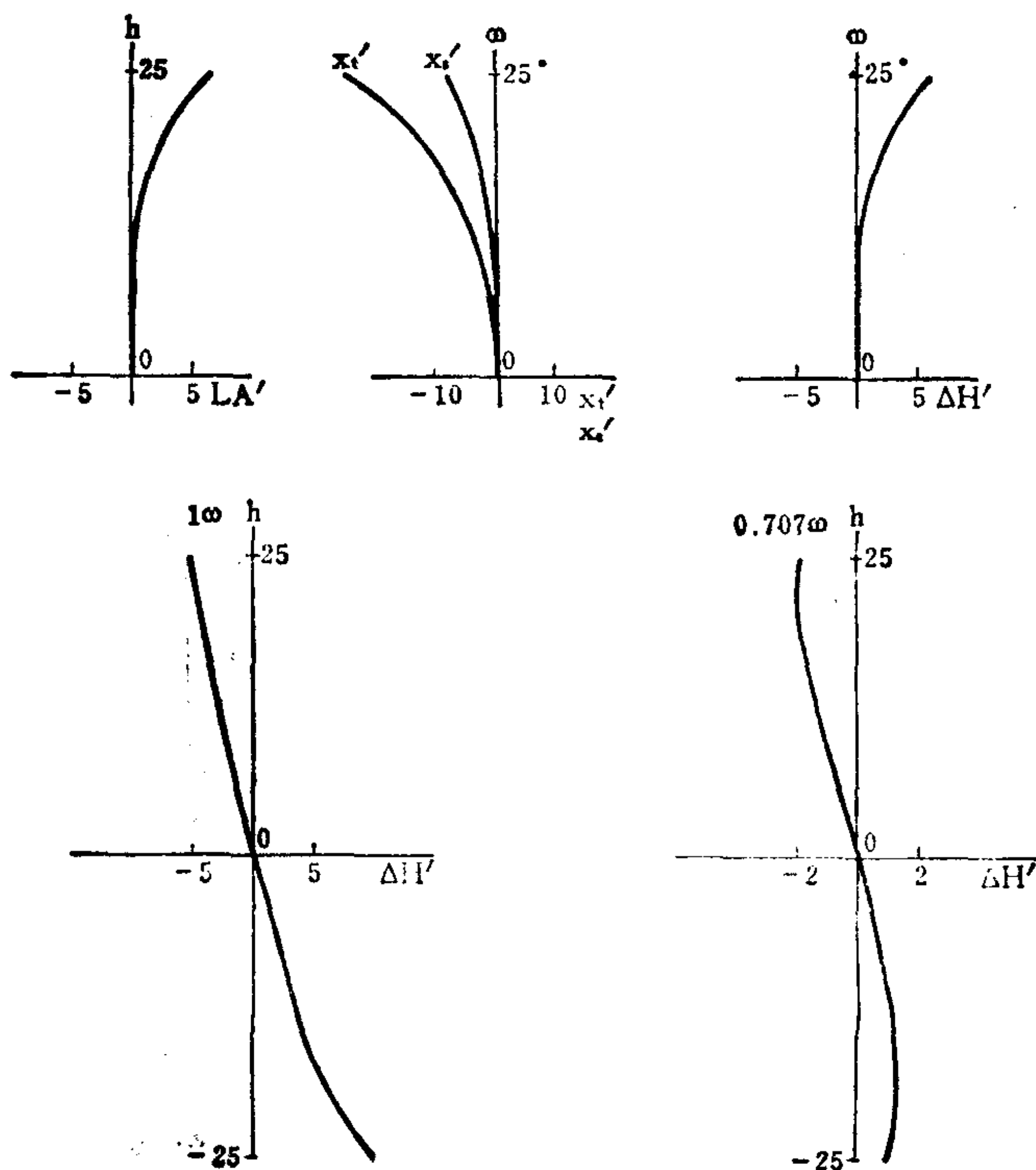
序号	r	d	n	v	序号	r	d	n	v
1	44.506	9.212	1.6031	60.7	8	-20.661	2.632	1.7400	31.7
2	120.873	0.392			9	-64.297	0.329		
3	44.95	5.264	1.6031	60.7	10	-62.544	5.264	1.6516	58.7
4	75.714	0.329			11	-30.053	1.645		
5	34.010	2.303	1.5927	35.3	12	-96.008	7.567	1.7570	47.9
6	17.994	3.948	1.7130	53.9	13	-37.835			
7	20.178	24.346*							

24.346* = 12.173 + 12.173

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	0.2404	-0.2426	-0.5372	-0.1401	1.9344	46.6	12.7%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	6.554	5.930	-25.93	-7.42	-18.51	2.087	0.500
70	1.700	1.600	-10.00	-3.35	-6.65	-0.393	-0.231

注, 1. 以上象差值是按 $d_2 = 0.392$, $l = -\infty$ 计算的。

2. 改变 d_2 , 实现 $M = 4^* (NA = 0.029) \sim 8^*$ 。



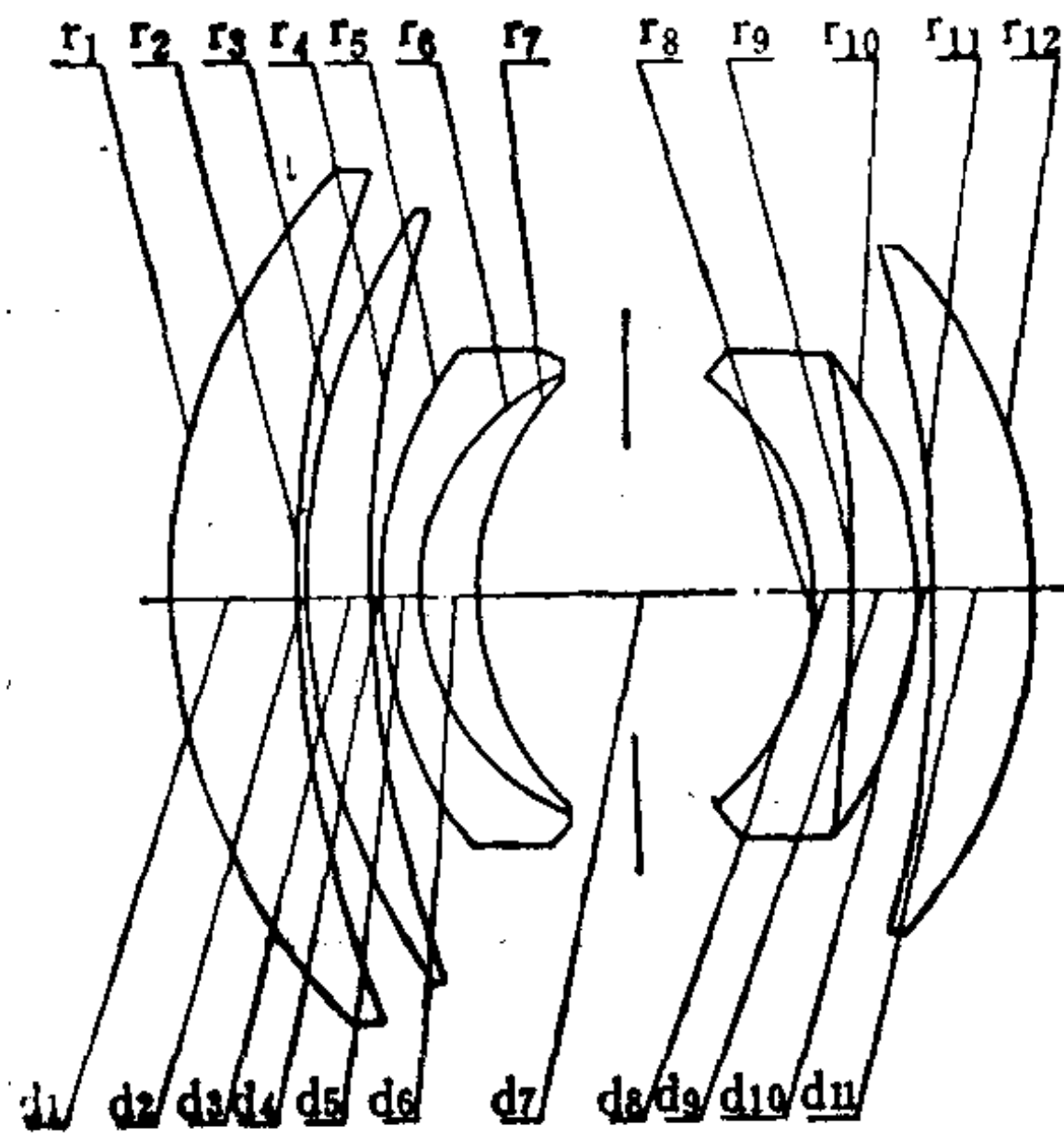
高斯型放大制版物镜

E. F. L = 100

B. F. L = 54.25

FNo. = 2

F. A. = $\pm 25^\circ$



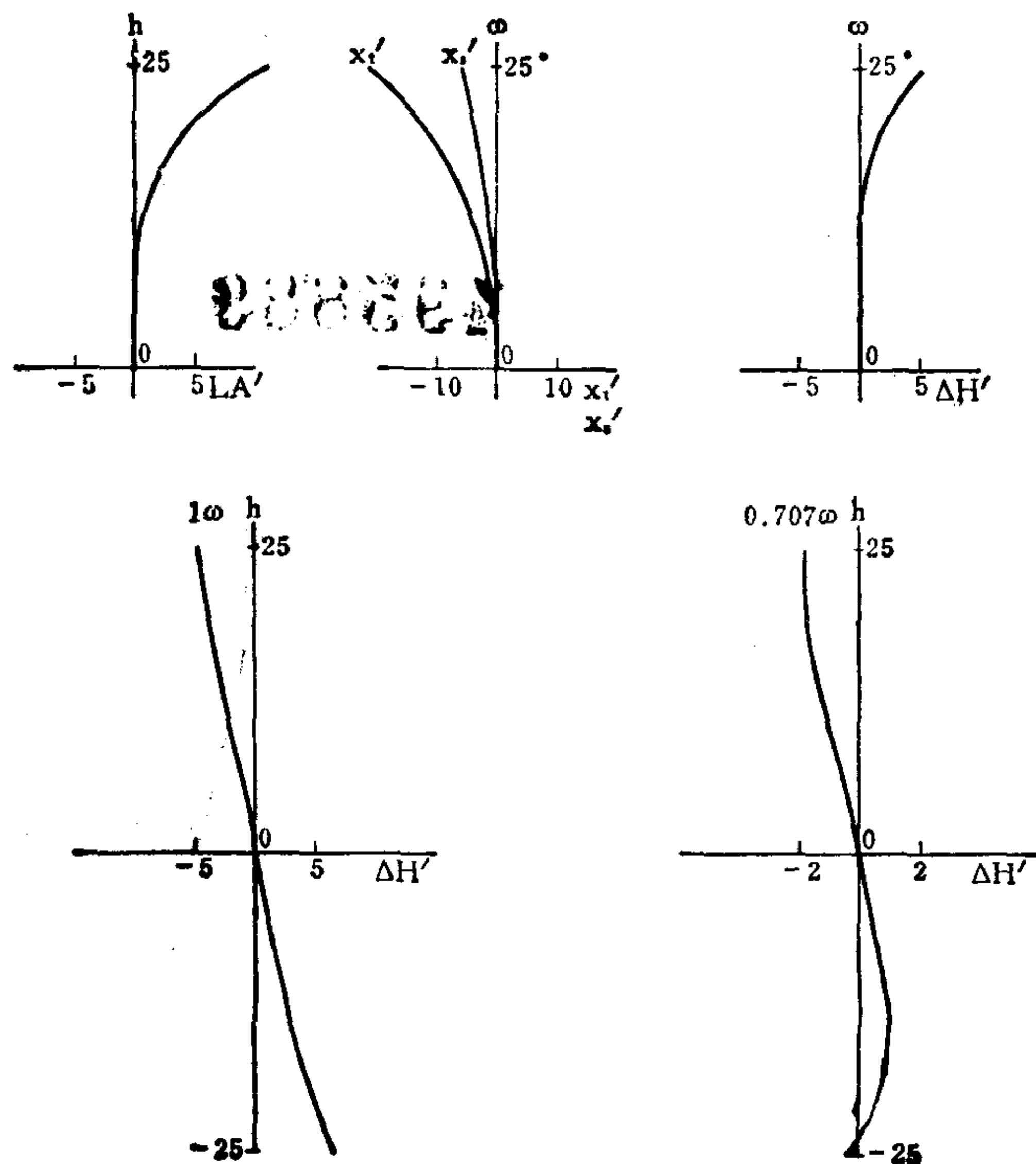
序号	r	d	n	v	序号	r	d	n	v
1	43.438	9.030	1.6031	60.7	7	19.767	24.510*		
2	86.163	0.323			8	-19.187	2.580	1.7495	35.2
3	47.660	5.160	1.6031	60.7	9	-90.487	5.160	1.6385	55.4
4	94.984	0.323			10	-27.870	1.613		
5	31.502	2.258	1.5927	35.3	11	-92.546	7.418	1.7570	47.9
6	16.622	3.870	1.7340	51.5	12	-36.289			

$$24.510^* = 12.250 + 12.260$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	0.2686	-0.2889	-0.4552	-0.1120	1.7034	46.6	10.9%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	11.731	5.118	-21.30	-6.16	-15.14	1.1677	0.1638
70	-2.296	1.425	-8.50	-2.83	-5.67	-1.1836	-0.4159

注: 1. 以上象差值是按 $d_2 = 0.323$, $l = -\infty$ 计算的。

2. 改变 d_2 , 实现 $M = 4^\times$ ($NA = 0.028$) $\sim 8^\times$ 。



编号: 07-00-010

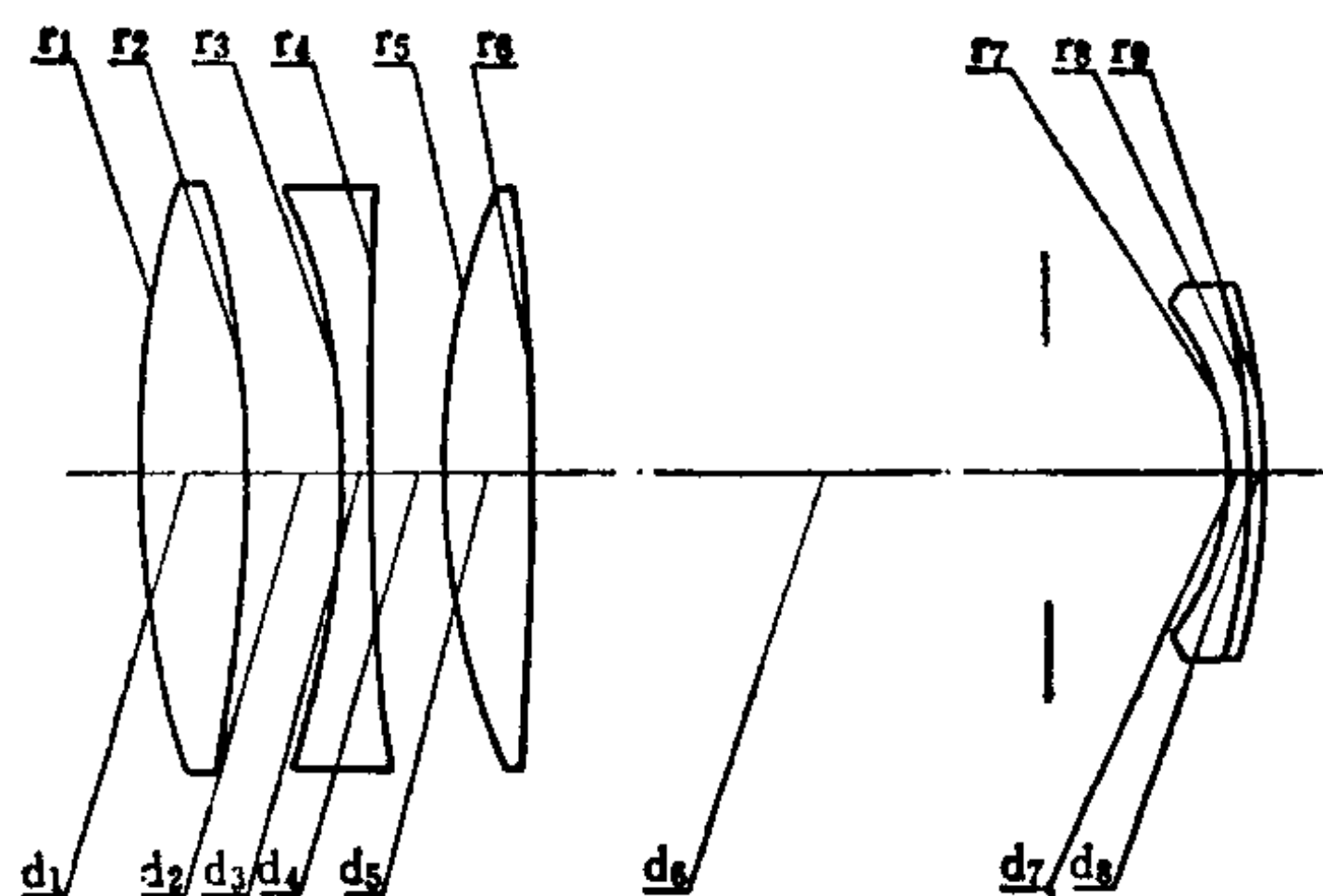
大 孔 径 远 摄 物 镜

E. F. L = 100

B. F. L = 23.73

FNo. = 2.8

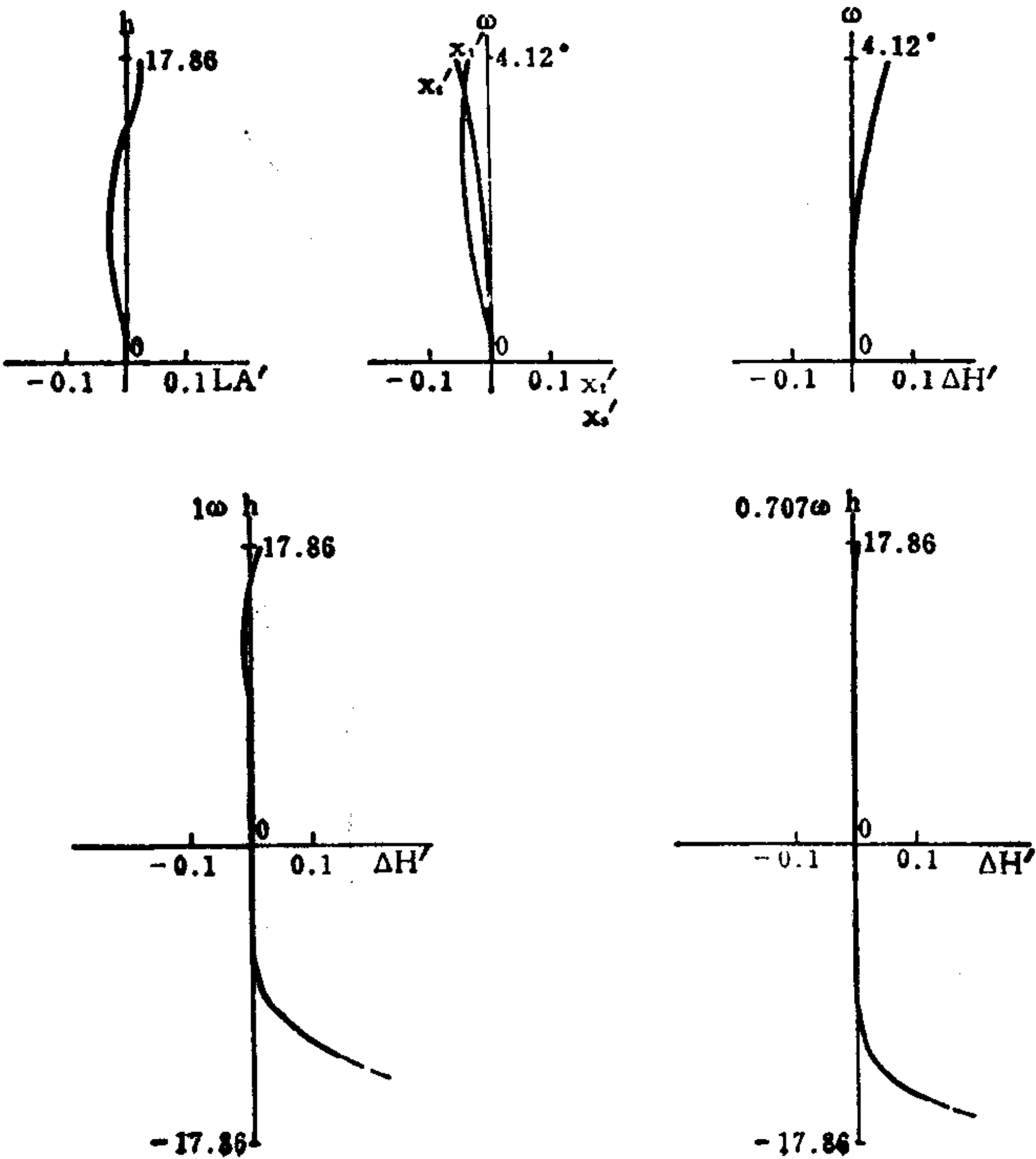
F. A. = $\pm 4.12^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	40.5860	7.4978	1.43387	95.1	6	-174.7872	41.1339*		
2	-64.2620	5.0632			7	-15.9528	0.6936	1.51633	64.1
3	-48.2052	1.7929	1.78590	44.2	8	-63.1176	1.2484	1.72151	29.2
4	269.4636	3.4680			9	-34.8221			
5	38.0994	5.5696	1.48749	70.1					

$41.1339^* = 30.0000 + 11.1339$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.01106	0.00387	-0.00200	-0.00218	0.02154	7.2	0.8%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.0173	0.0602	-0.0361	-0.0487	0.0126	3.3447	0.0702
70	-0.0169	0.0213	-0.0375	-0.0281	-0.0094	0.3879	0.0018



编号: 07-00-011

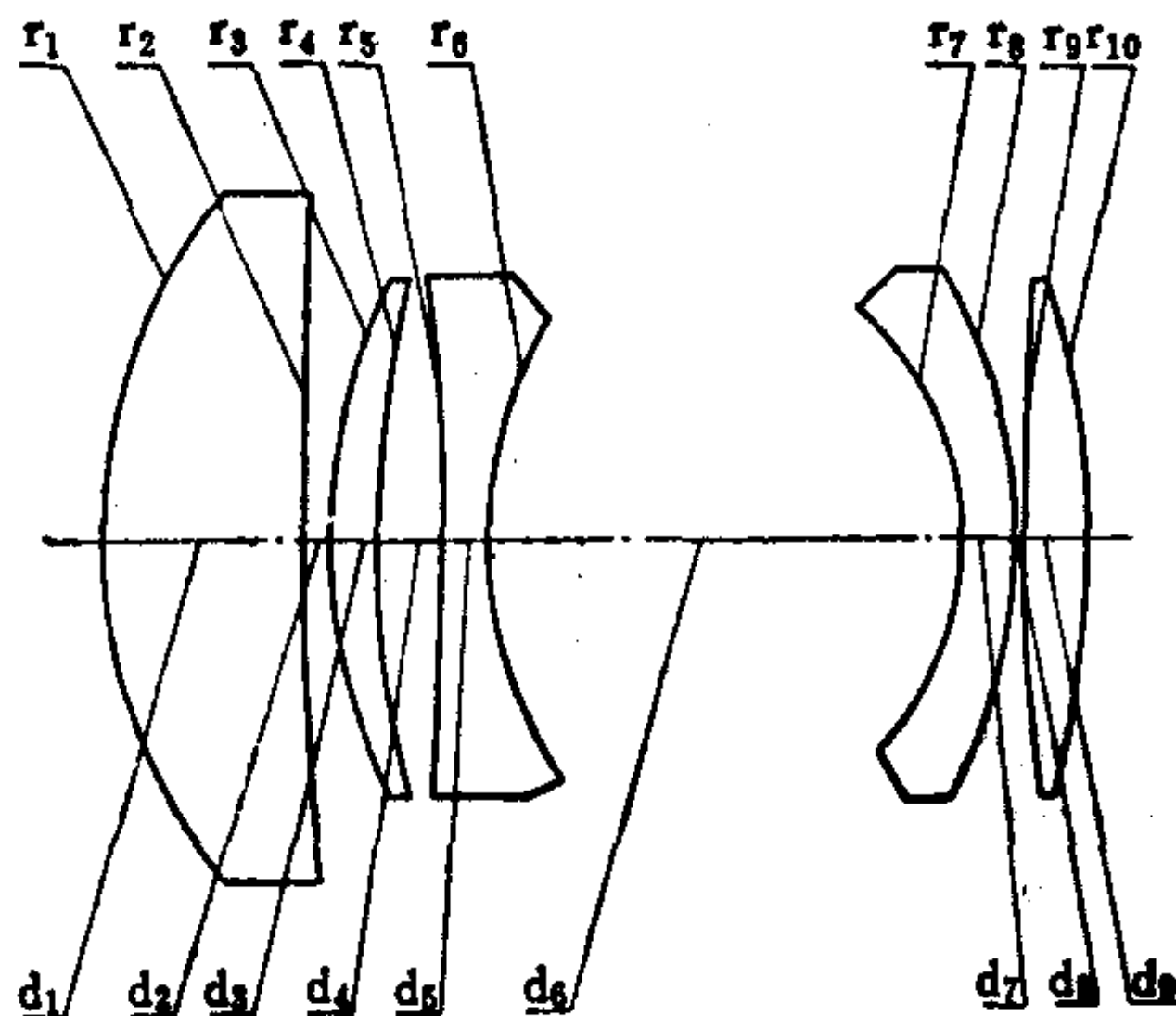
远 摄 物 镜

E. F. L = 1

B. F. L = 0.36

FNo. = 2.8

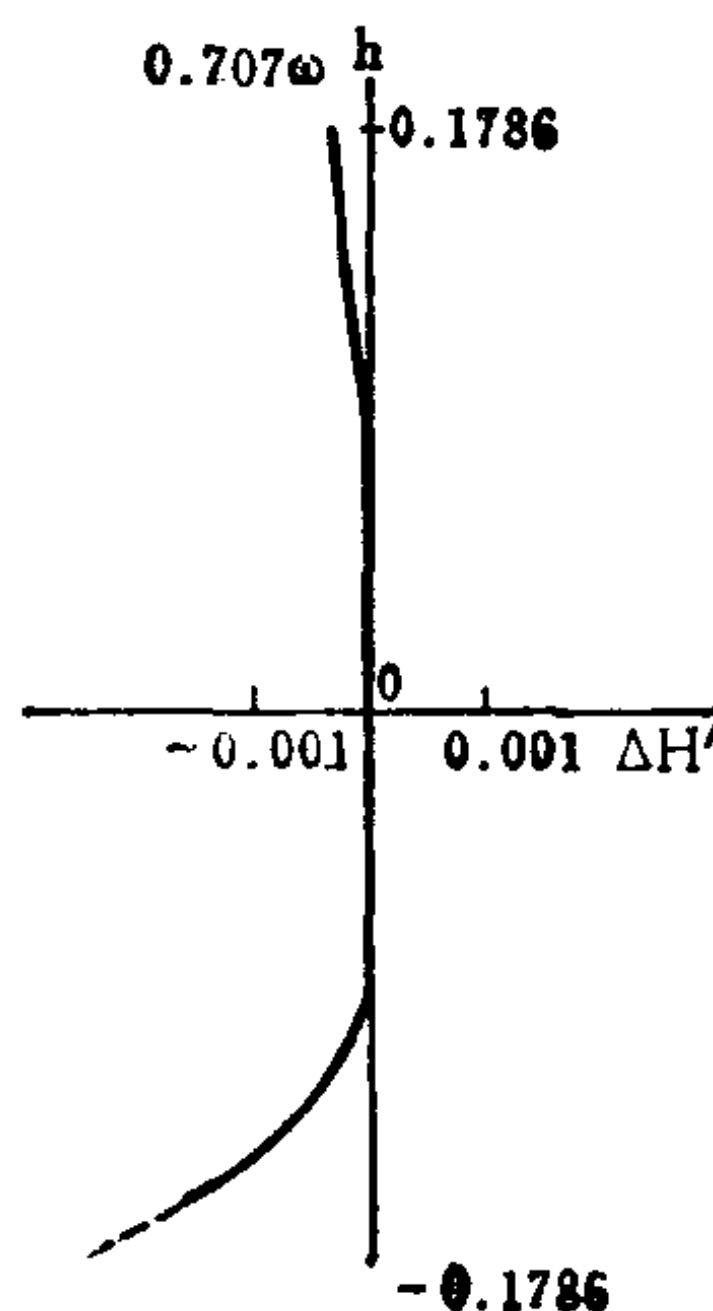
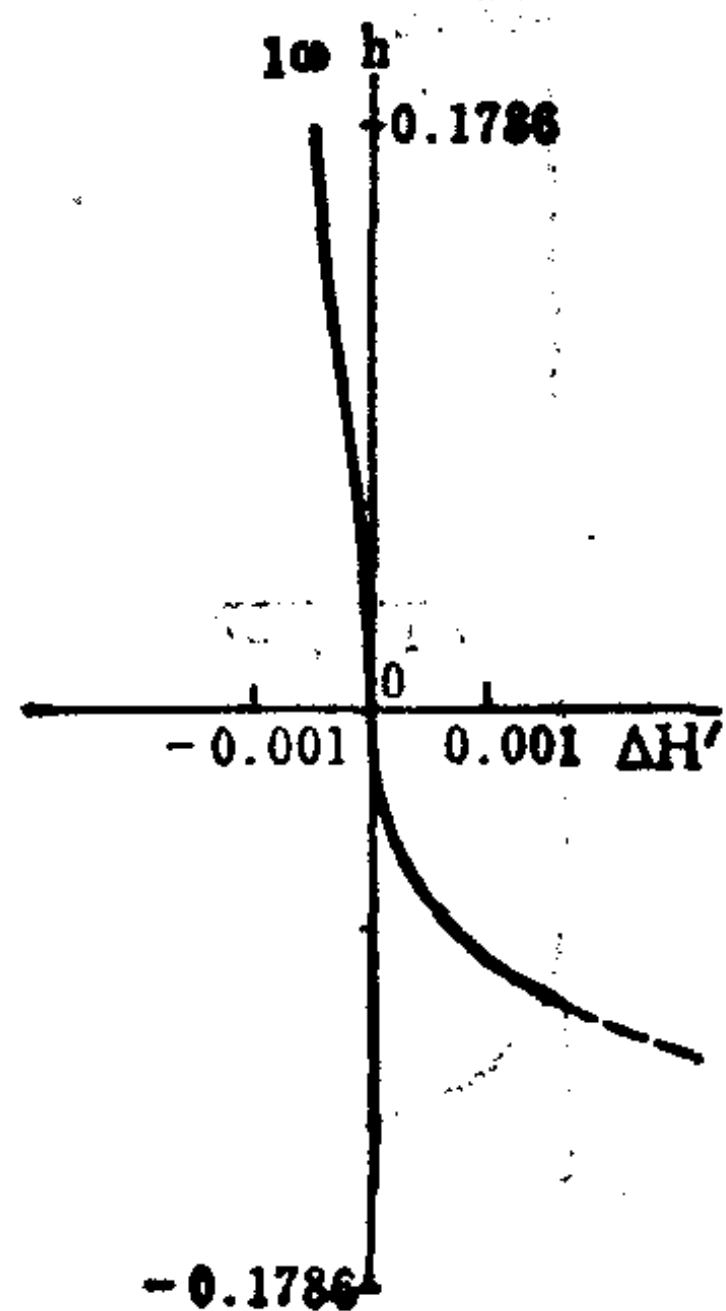
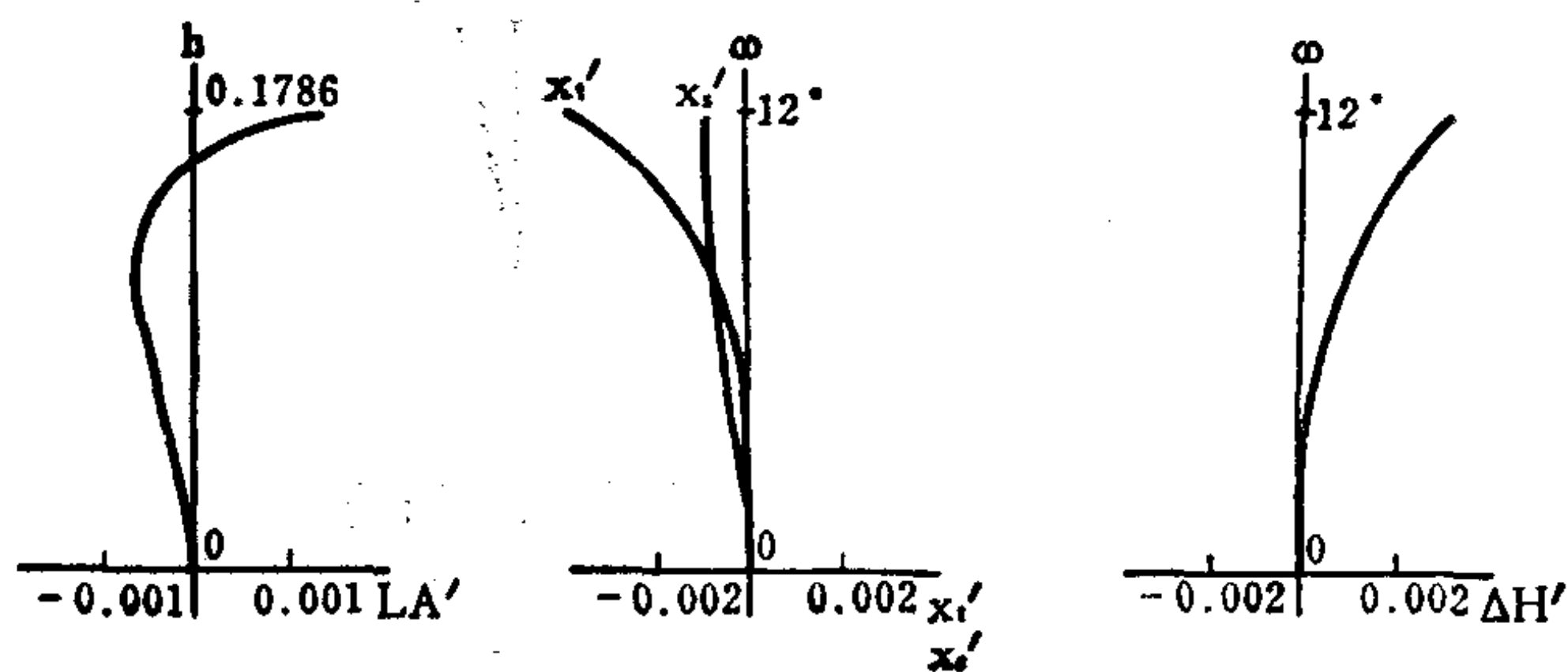
F. A. = $\pm 12^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	0.31245	0.12459	1.62041	60.2	6	0.24769	0.27499*		
2	24.05484	0.00400			7	-0.18235	0.03000	1.58913	61.0
3	0.30835	0.03099	1.58913	61.0	8	-0.31186	0.00200		
4	0.63555	0.03400			9	3.31487	0.03650	1.72342	37.9
5	-3.21278	0.03485	1.71736	29.5	10	-0.53436			

$$0.27499^* = 0.14000 + 0.13499$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.000195	0.000129	-0.000071	-0.000109	0.001193	0.21	1.5%
h 或 ω %	LA'	$\Delta H'$	x'_i	x'_s	$x'_i - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.00143	0.00332	-0.00392	-0.00091	-0.00301	-0.17208	0.00374
70	-0.00065	0.00115	-0.00096	-0.00081	-0.00015	-0.00279	-0.00032



编号: 07-00-012

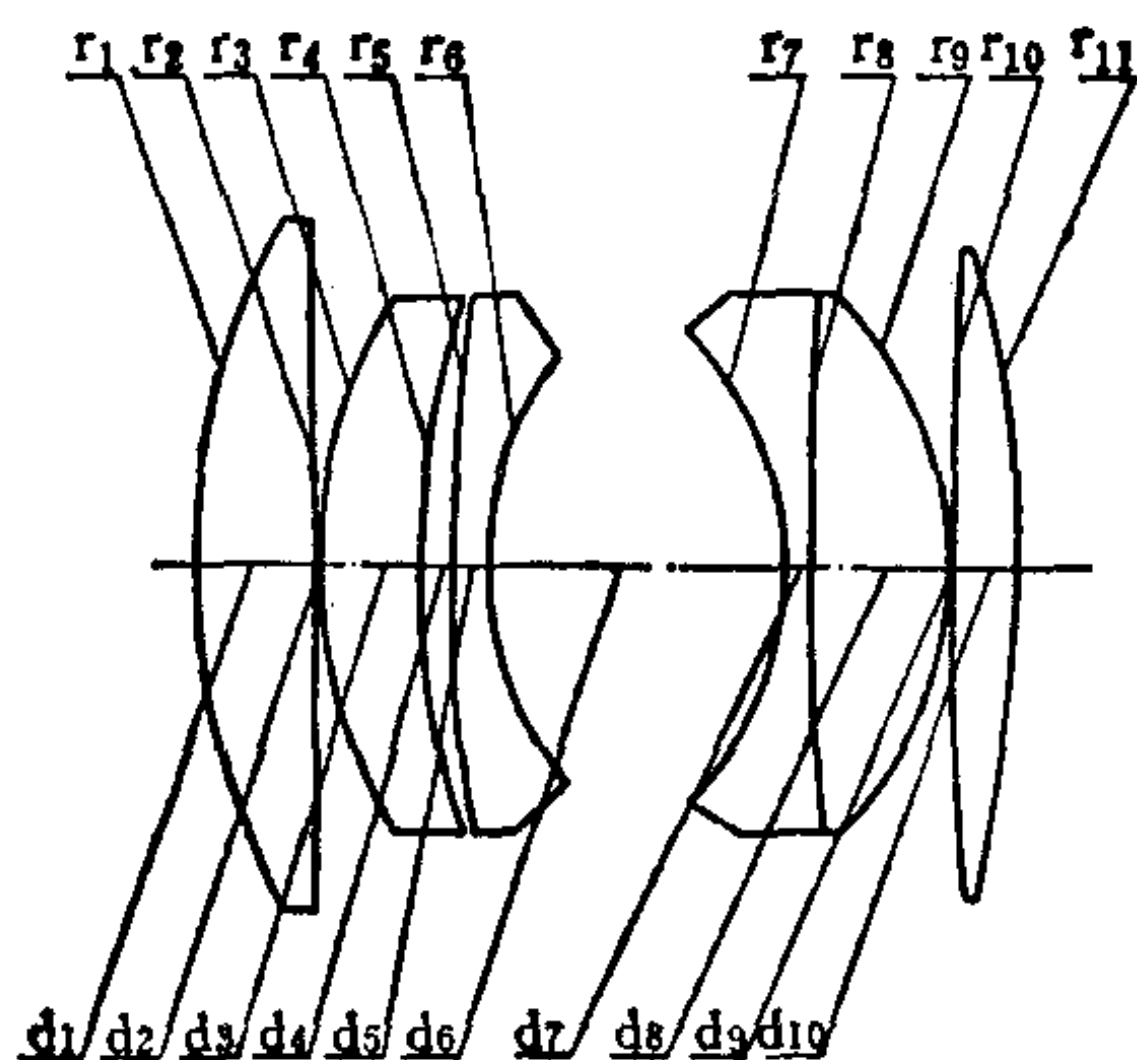
照 相 物 镜

E. F. L = 1

B. F. L = 0.7187

FNo. = 1.7

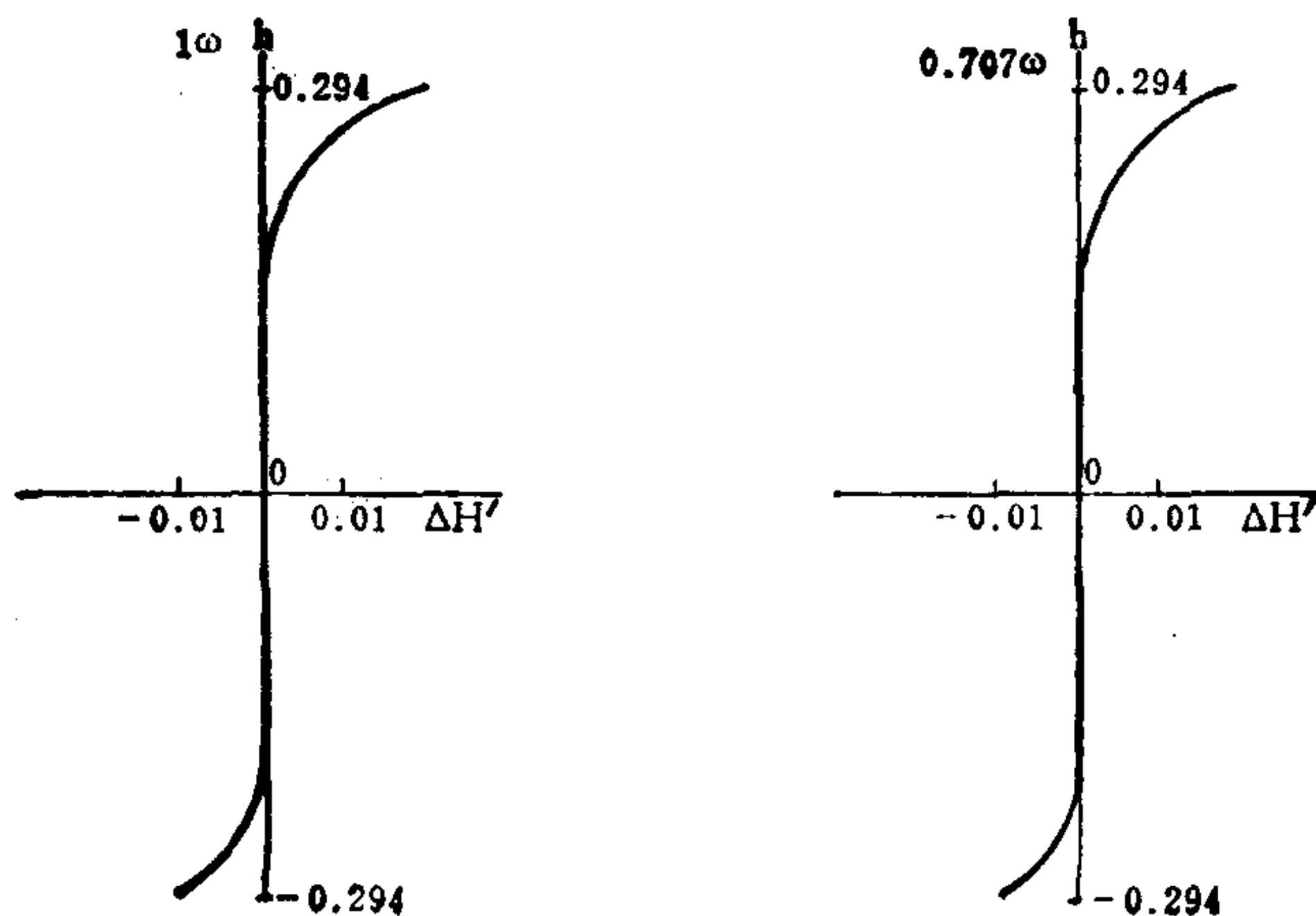
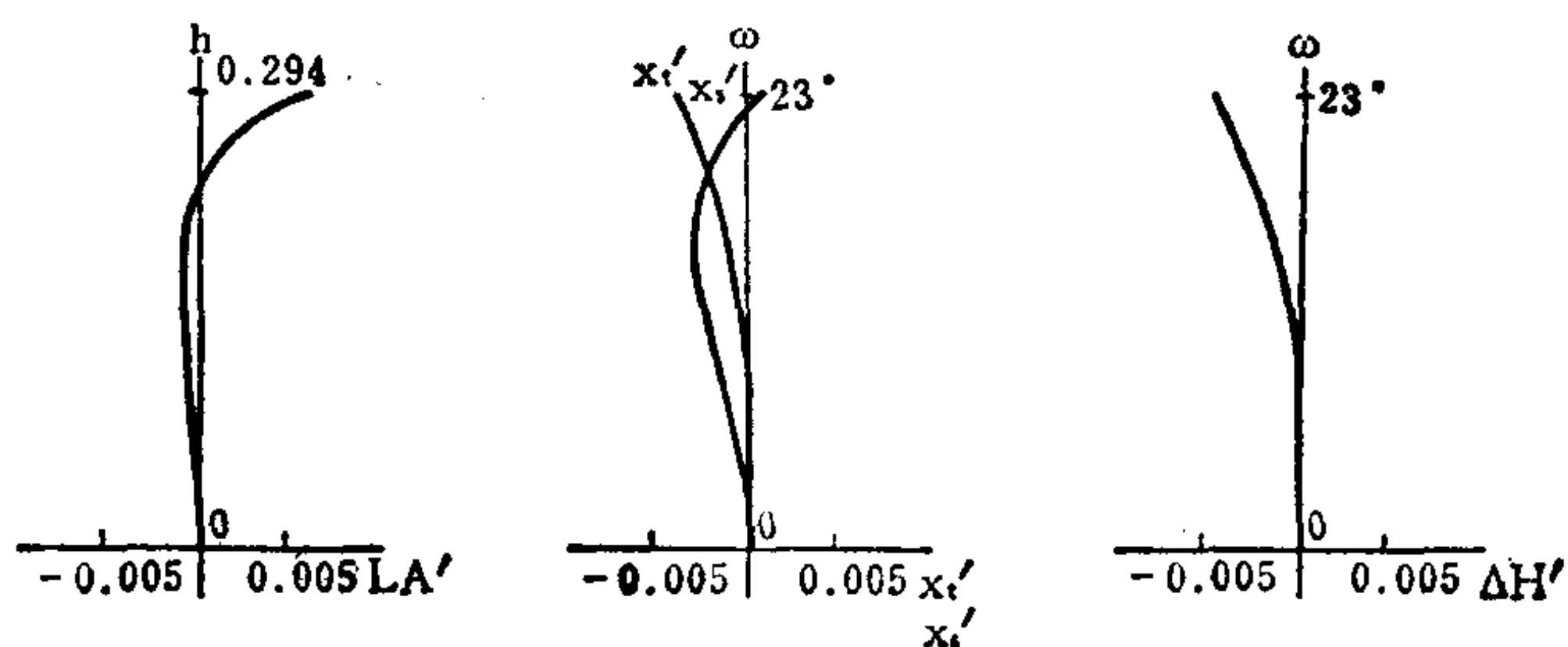
F. A. = $\pm 23^\circ$



序号	r	d	n	v_d	序号	r	d	n	v_d
1	0.6102	0.1050	1.62299	58.2	7	-0.3002	0.0200	1.69895	30.1
2	6.5307	0.0020			8	3.6790	0.1200	1.65844	50.9
3	0.4429	0.0900	1.67003	47.3	9	-0.3623	0.0020		
4	0.7880	0.0200			10	2.4480	0.0580	1.80610	40.8
5	1.7250	0.0301	1.61293	37.0	11	-1.0667			
6	0.2908	0.2560*							

0.2560* = 0.1280 + 0.1280

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.001073	-0.000047	0.000741	-0.002675	-0.001868	0.42	-1.2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.00548	-0.00523	-0.00412	0.00119	-0.00531	0.00393	0.00104
70	-0.00073	-0.00151	-0.00132	-0.00310	0.00178	0.00488	0.00094



编号: 07-00-013

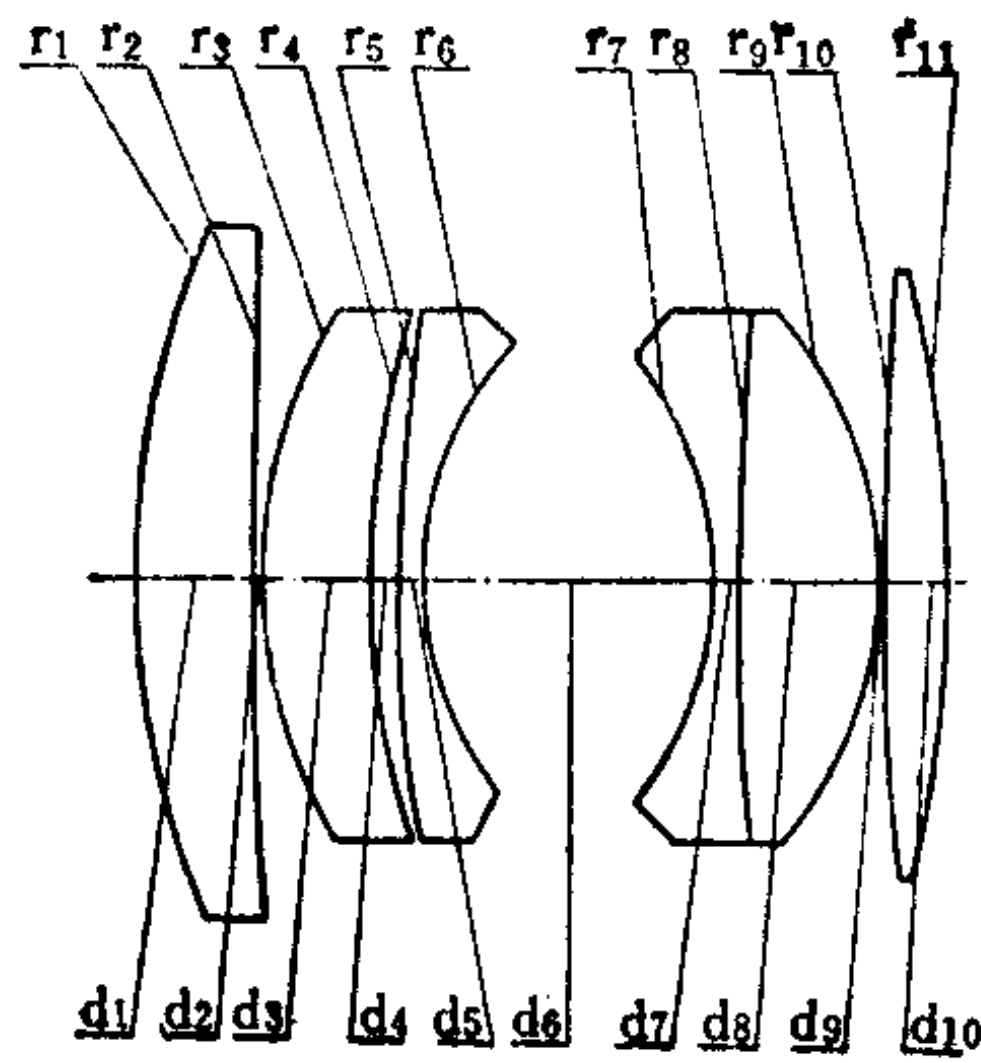
照 相 物 镜

E. F. L = 1

B. F. L = 0.7196

FNo. = 1.7

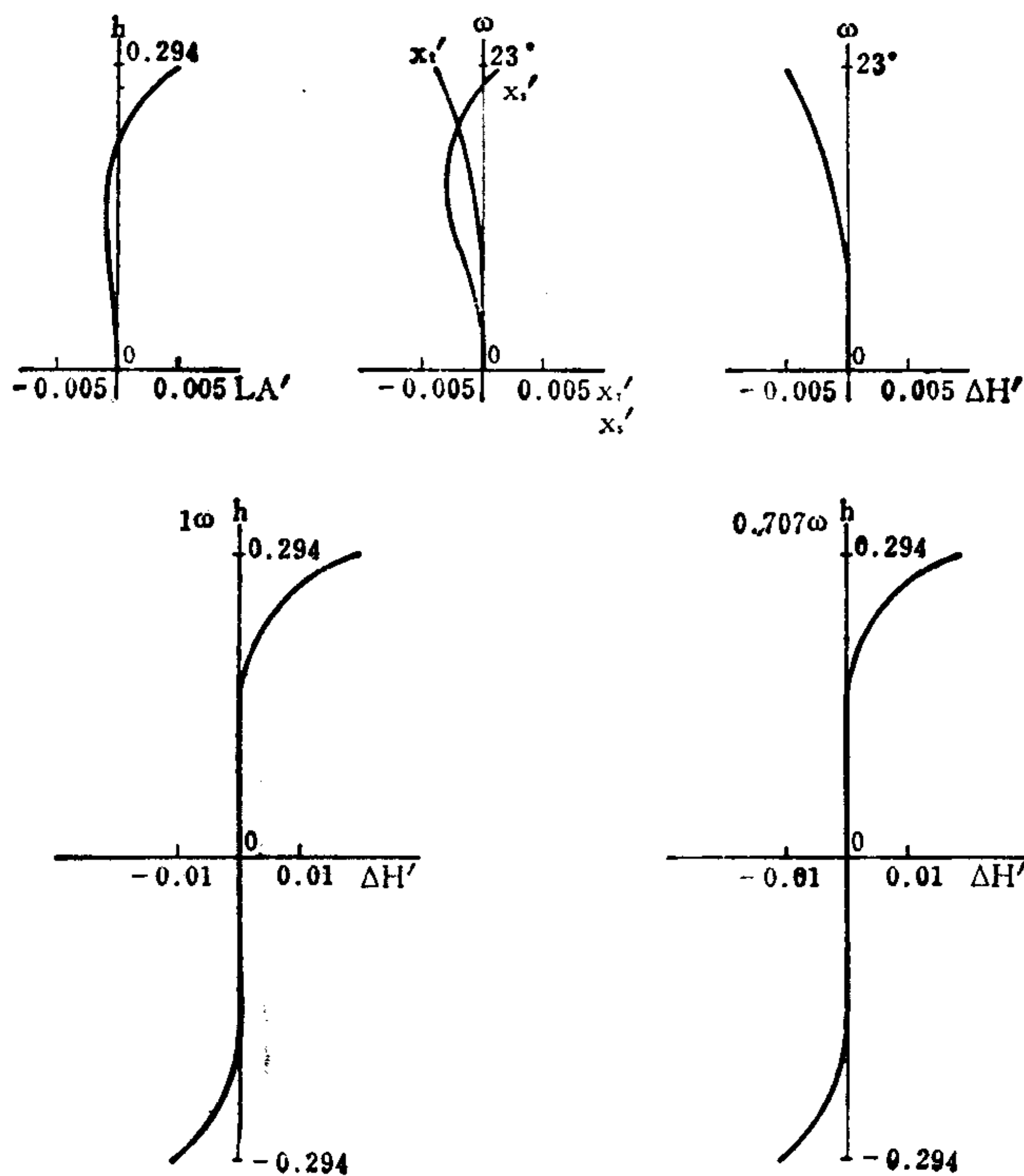
F. A. = $\pm 23^\circ$



序号	r	d	n	v_d	序号	r	d	n	v_d
1	0.6610	0.1050	1.62299	58.2	7	-0.3044	0.0200	1.69895	30.1
2	6.9311	0.0020			8	3.4250	0.1200	1.65844	50.9
3	0.4525	0.0950	1.74400	44.8	9	-0.3665	0.0020		
4	0.7626	0.0200			10	2.4620	0.0600	1.80610	40.8
5	1.5060	0.0300	1.62588	35.7	11	-1.0764			
6	0.2981	0.2500*							

0.2500* = 0.1250 + 0.1250

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.000950	-0.000092	0.000655	-0.002592	-0.001777	0.42	-1.2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.00557	-0.00513	-0.00399	0.00141	-0.00540	0.00342	0.00099
70	-0.00051	-0.00146	-0.00166	-0.00306	0.00140	0.00394	0.00081



编号: 07-02-014

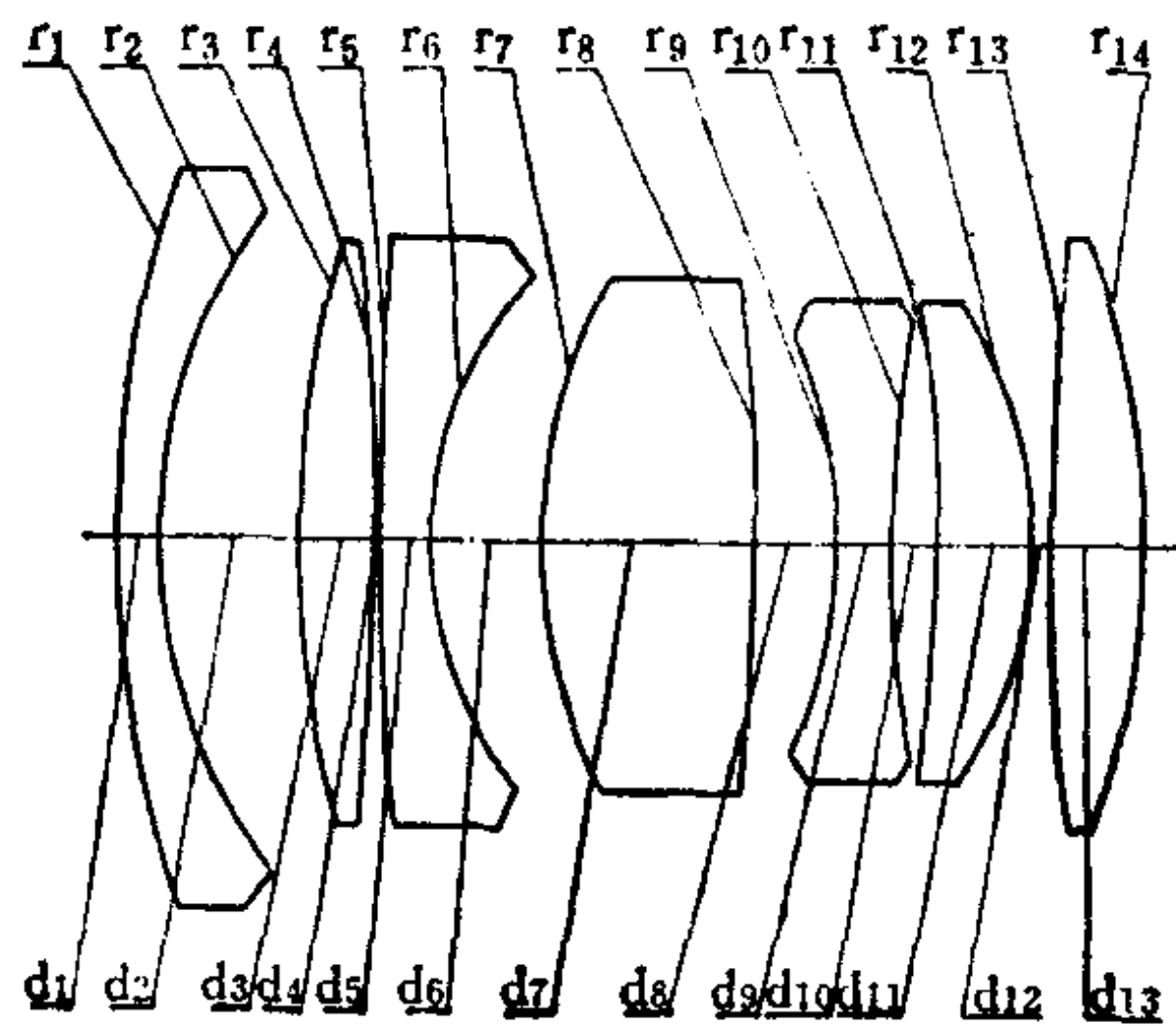
广 角 照 相 物 镜

E. F. L = 97

B. F. L = 119.3

FNo. = 1.94

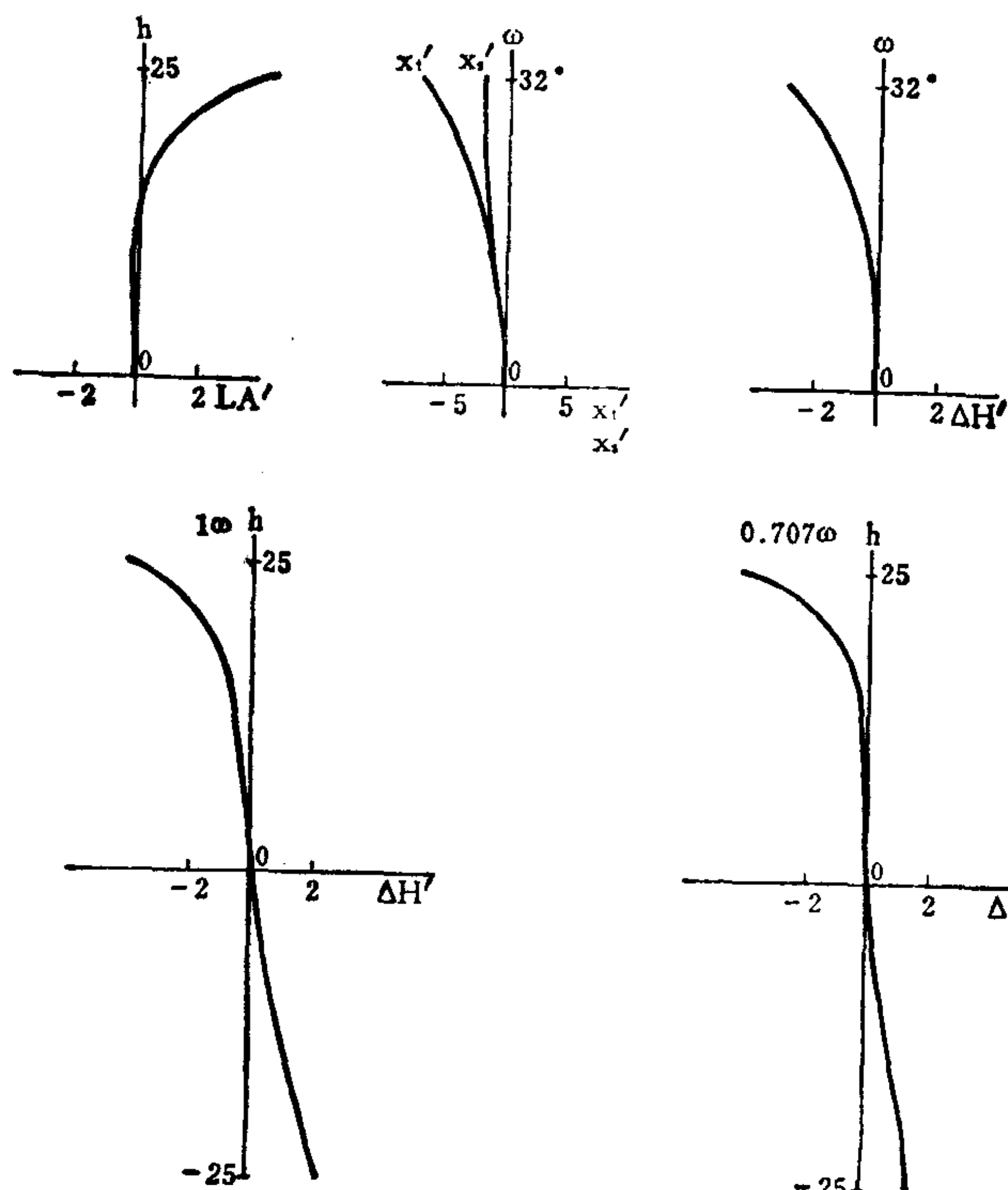
F. A. = $\pm 32^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	161.15	6.15	1.60738	56.8	8	-362.02	10.91*		
2	72.55	19.93			9	-69.86	7.23	1.80518	25.4
3	186.64	10.50	1.71300	53.9	10	152.00	6.69		
4	-402.24	0.59			11	-235.10	11.40	1.73400	51.5
5	1834.76	6.41	1.56873	63.1	12	-60.16	2.00		
6	49.54	14.12			13	381.07	12.45	1.64000	60.2
7	65.07	30.23	1.79952	42.2	14	-105.28			

10.91* = 5.00 + 5.91

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.1608	0.2604	-0.1654	-0.3481	-1.2669	60.6	-4.9%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	4.358	-2.977	-7.209	-2.277	-4.932	-1.0101	0.2282
70	0.551	-1.037	-3.463	-1.777	-1.686	-1.3835	0.2978



编号: 07-02-015

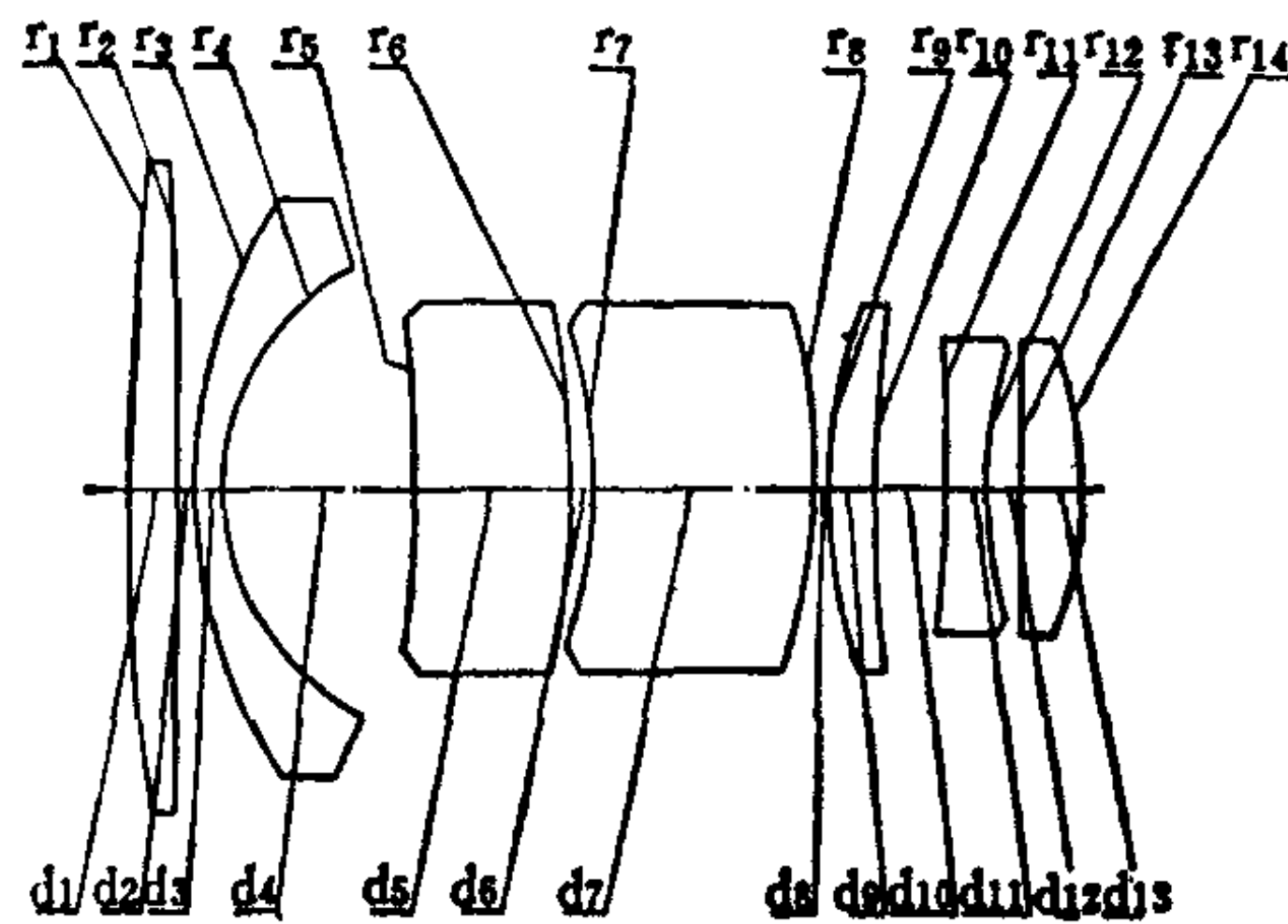
反 远 距 型 广 角 物 镜

E. F. L = 100

B. F. L = 138.49

FNo. = 4

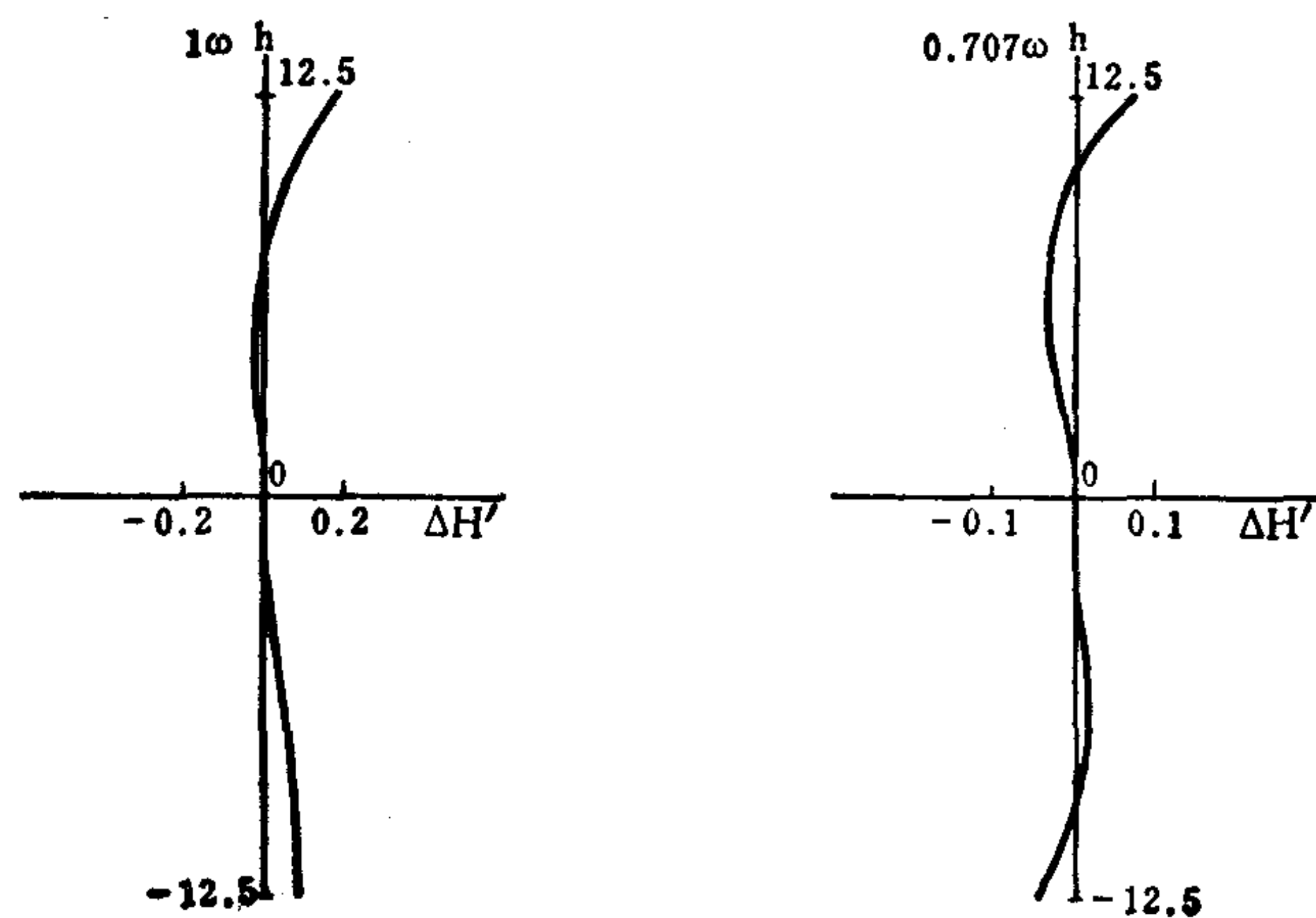
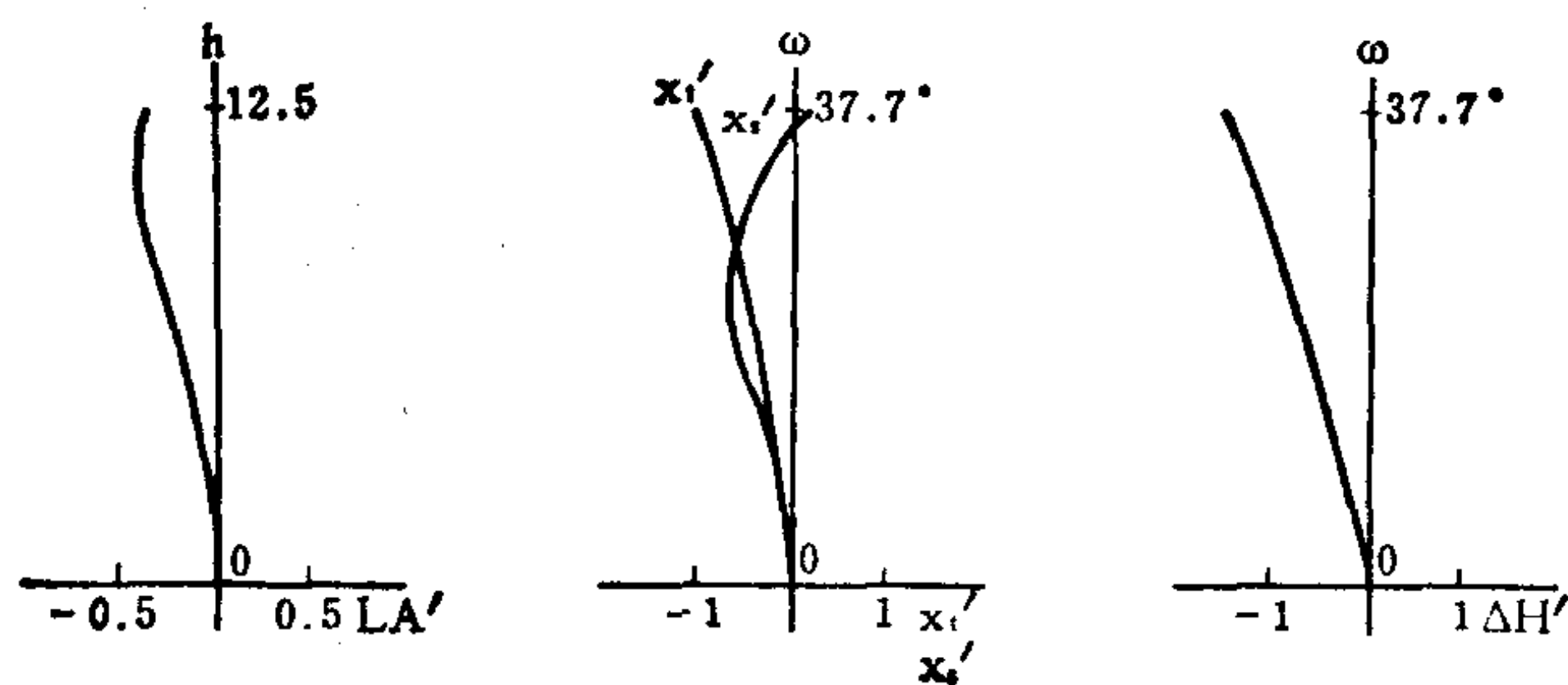
F. A. = $\pm 37.7^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	865.02	6.83	1.67003	47.3	8	-77.90	0.88		
2	-1424.08	1.05			9	67.11	6.78	1.72600	53.6
3	72.62	3.82	1.61800	63.4	10	238.28	10.35*		
4	35.36	27.33			11	-370.33	6.97	1.75520	27.5
5	-463.53	22.75	1.66892	45.0	12	70.66	2.75		
6	-114.16	2.67			13	∞	7.90	1.72600	53.6
7	-68.35	31.42	1.67790	55.3	14	-64.98			

10.35* = 5.00 + 5.35

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.030795	0.000143	0.000834	-0.049637	-0.555438	77.3	-2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.3315	-1.544	-0.999	0.195	-1.194	0.1366	0.0415
70	-0.3605	-0.882	-0.606	-0.576	-0.030	0.0157	-0.0085



编号: 07-02-016

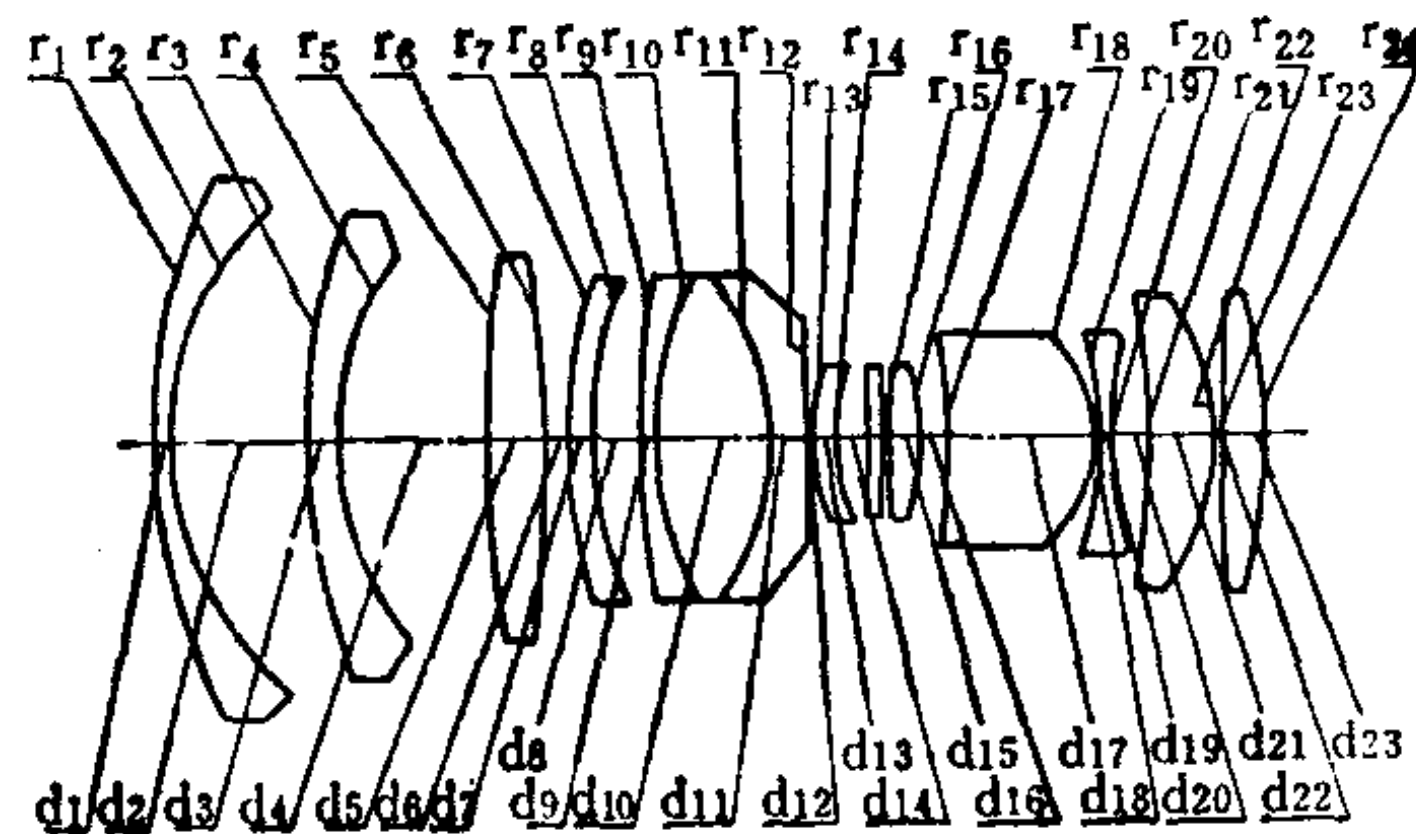
超广角大孔径物镜

E. F. L = 102.1

B. F. L = 200.3

FNo. = 2.86

F. A. = $\pm 50.36^\circ$



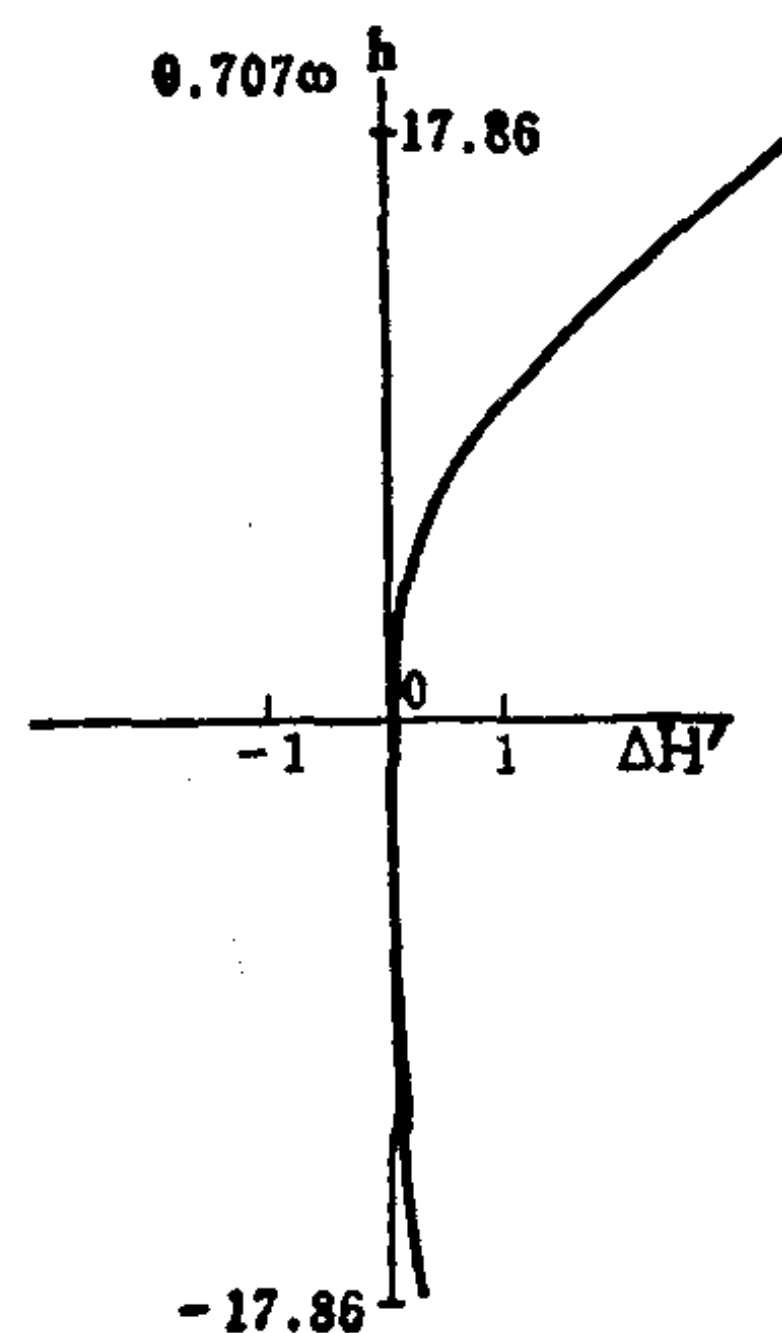
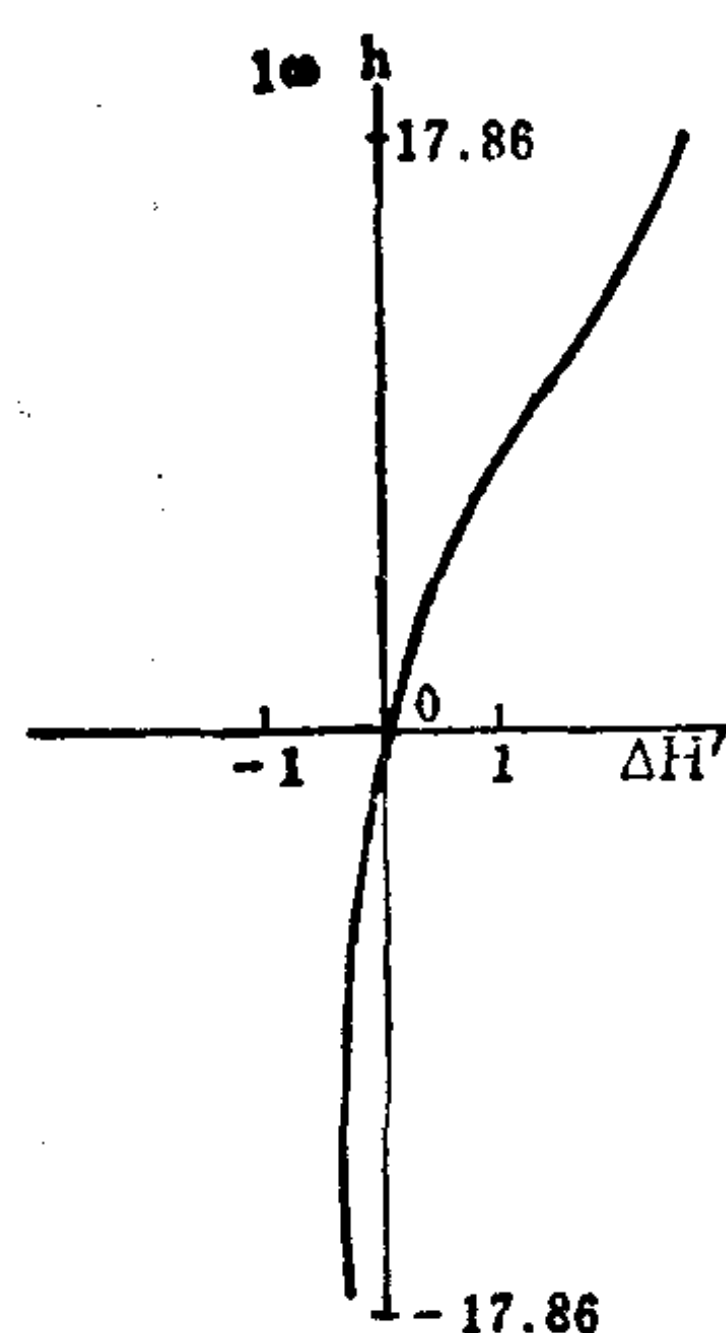
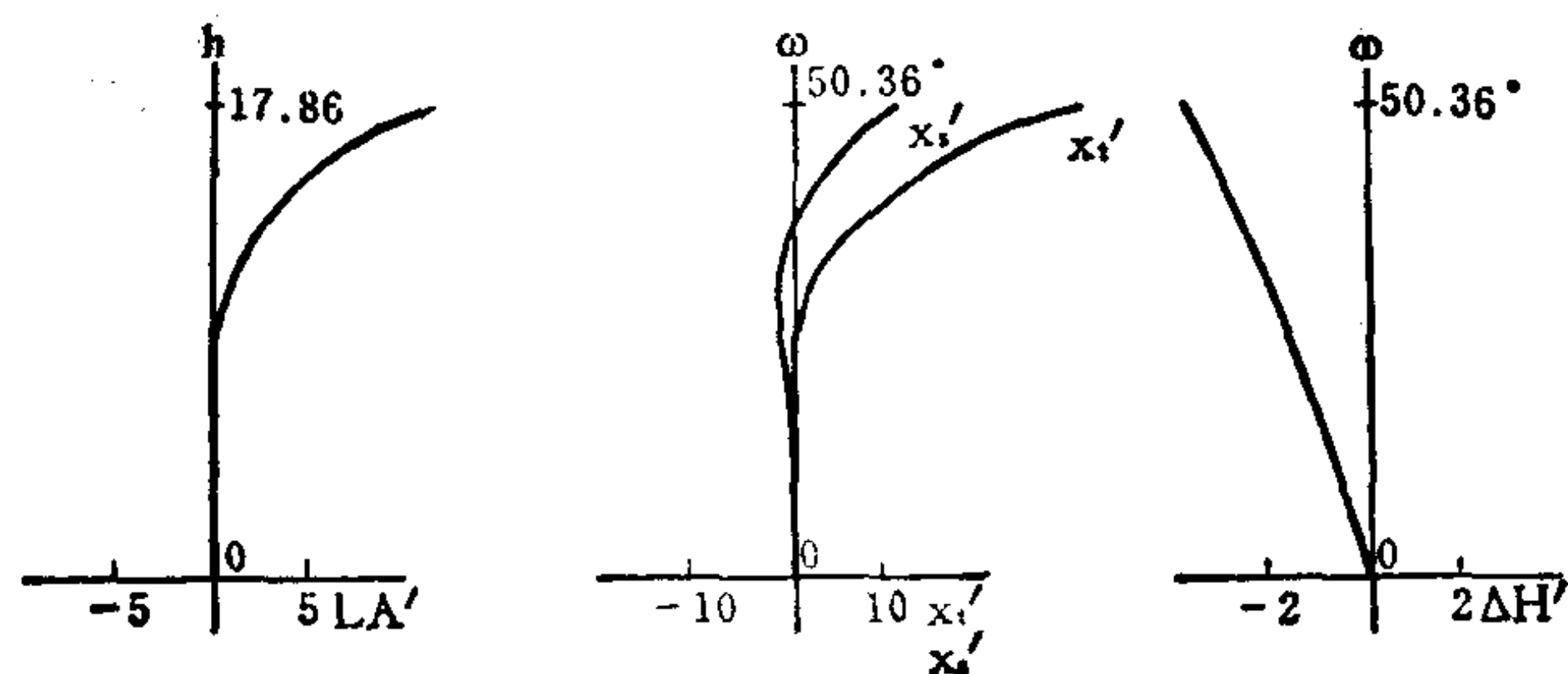
序号	r	d	n	v	序号	r	d	n	v
1	256.3	6.5	1.6031	60.7	14	47.6	20.5*		
2	121.6	47.4			15	∞			滤色片
3	253.9	14.1	1.7410	52.7	16	∞			
4	125.8	57.4			17	455.8	10.3	1.8051	25.4
5	783.8	22.9	1.6258	35.7	18	-249.8	9.9		
6	-430.9	6.1			19	-834.6	57.2	1.4645	66.0
7	211.3	9.3	1.8160	46.8	20	-66.9	0.5		
8	119.7	16.4			21	-201.9	5.4	1.8051	25.4
9	277.8	8.1	1.5473	53.6	22	157.9	11.1		
10	119.3	43.2	1.7200	50.2	23	-1167.6	25.5	1.4645	66.0
11	-100.4	12.6	1.5613	45.2	24	-95.6	0.5		
12	5113.5	0.5				10629.3	18.9	1.6204	60.3
13	89.6	8.1	1.6968	56.5		-209.0			

20.5* = 13.0 + 7.5

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.0091	0.1701	0.1815	-0.3255	-1.6049	123.3	-2.9%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	11.569	-3.681	30.75	11.17	19.58	1.1061	0.7047
70	1.778	-2.367	4.315	-0.268	4.583	1.8436	0.9224

注: 1. 以上象差值计算时, 未考虑滤色片。

2. 滤色片的基底玻璃是K9, $d = 4.3$ 。



编号: 07-02-017

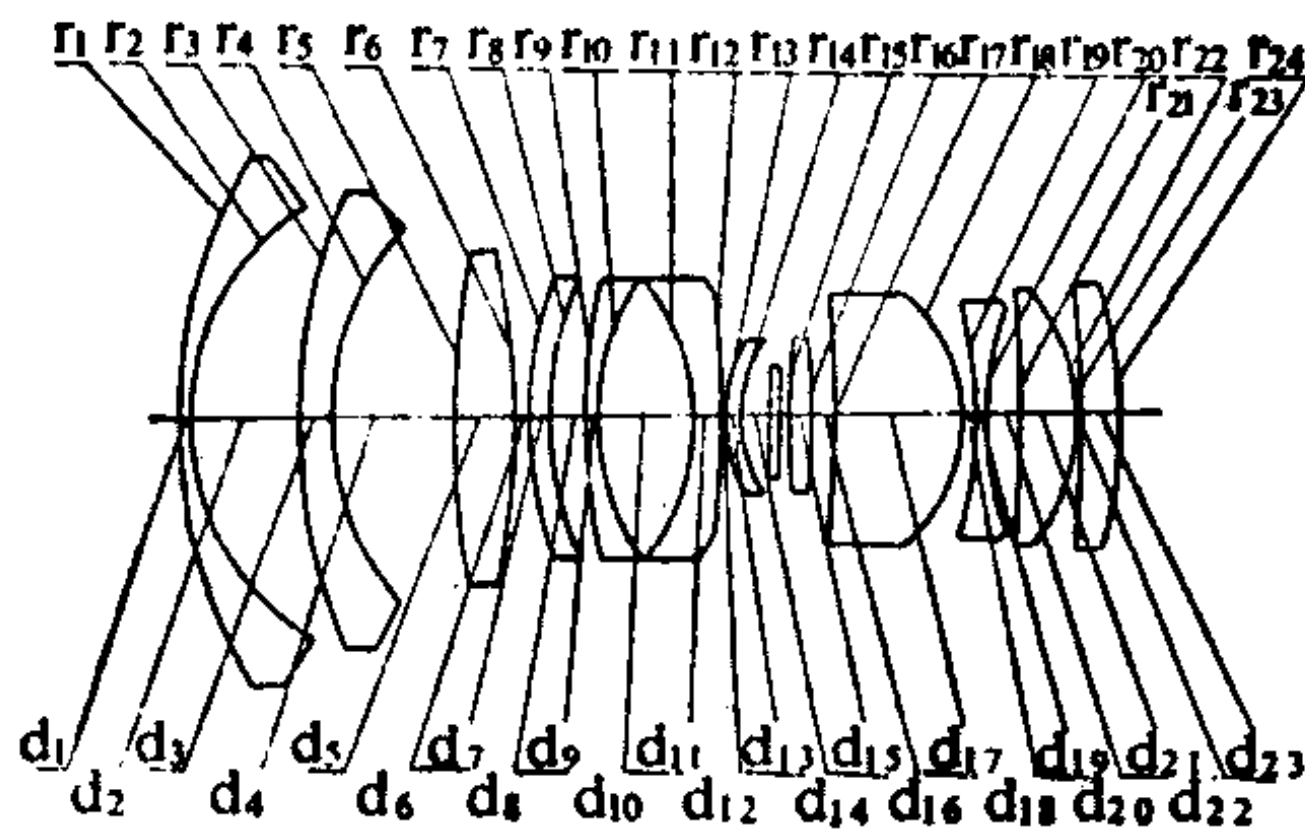
超 广 角 大 孔 径 物 镜

E. F. L = 102.5

B. F. L = 203.1

FNo. = 2.87

F. A. = $\pm 50.3^\circ$



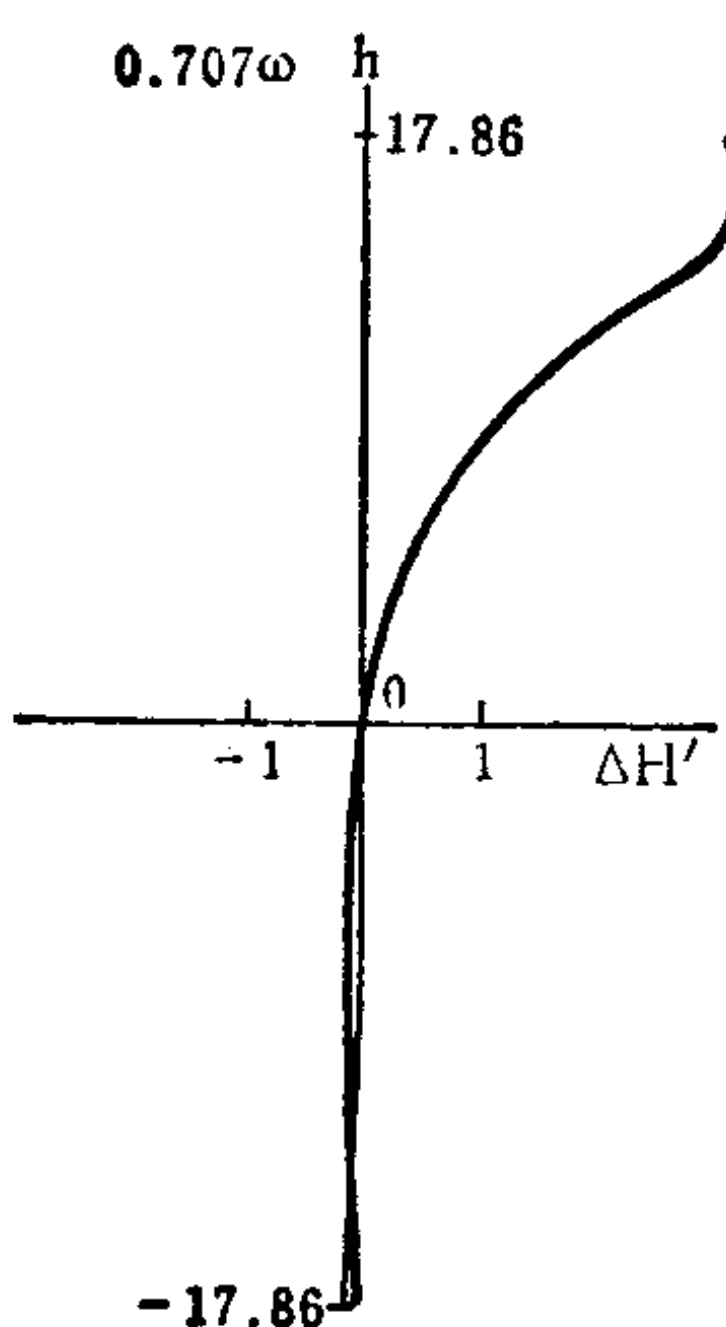
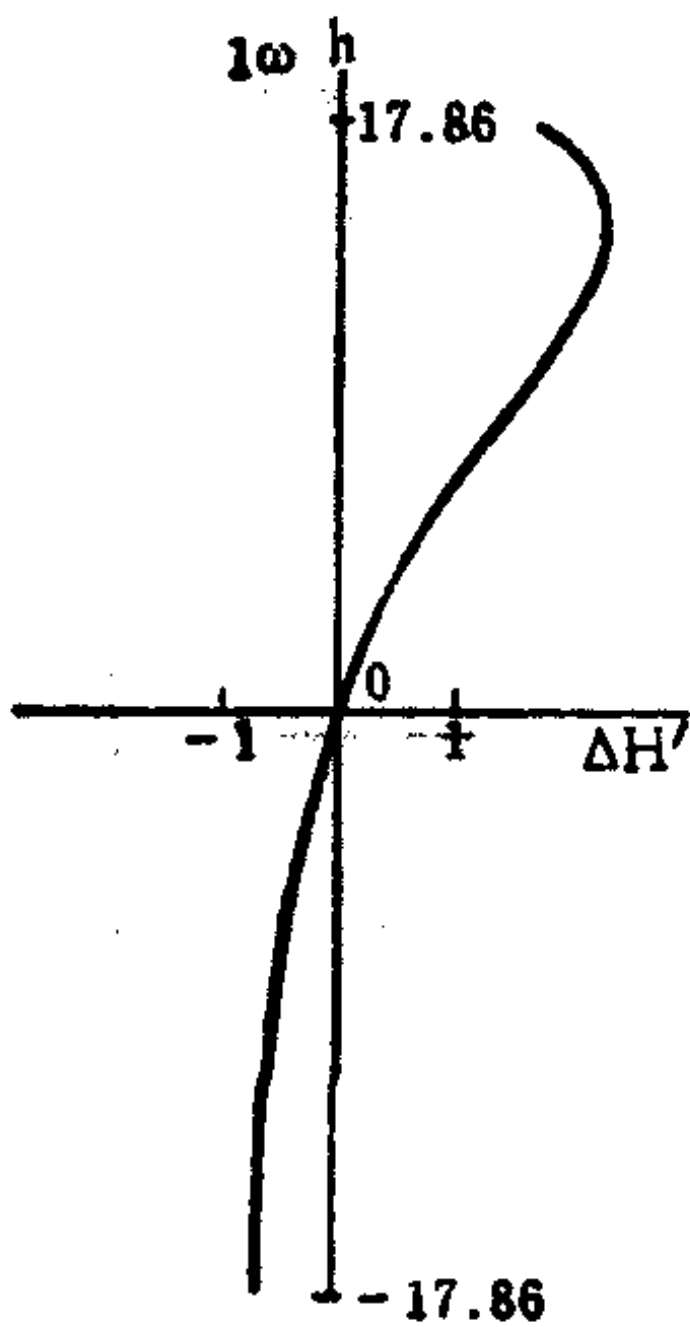
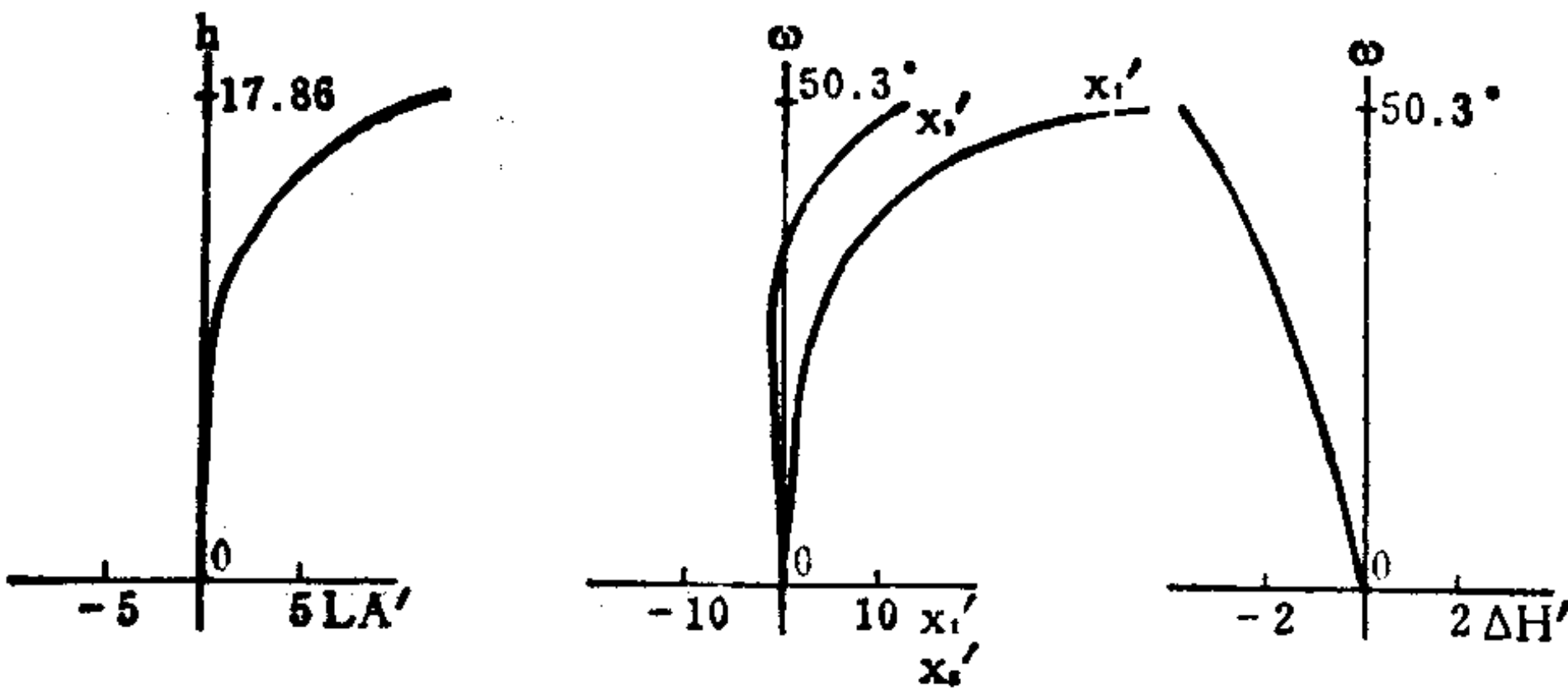
序号	r	d	n	v	序号	r	d	n	v
1	234.4	6.5	1.6031	60.7	14	47.5	16.9*		
2	115.9	48.9				∞			滤色片
3	281.5	14.1	1.7340	51.5		∞			
4	121.9	56.5			15	485.3	11.7	1.8051	25.4
5	600.7	27.6	1.6200	36.3	16	-264.1	9.9		
6	-416.3	7.1			17	-5686.1	62.1	1.4645	66.0
7	205.1	9.3	1.7995	42.2	18	-66.7	0.5		
8	129.4	14.5			19	-273.7	6.5	1.8051	25.4
9	280.4	8.1	1.5523	63.7	20	151.0	14.6		
10	111.9	42.1	1.7200	50.2	21	-725.0	23.4	1.4645	66.0
11	-101.4	12.6	1.5613	45.2	22	-100.0	0.5		
12	-13184.4	0.5			23	-3616.9	18.7	1.6204	60.3
13	102.0	6.4	1.7200	50.2	24	-200.9			

$16.9^* = 10.0 + 6.9$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP ($i\omega$)
	0.0364	0.1927	0.2090	-0.3152	-1.5401	123.5	-3%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	13.558	-3.779	41.89	12.88	29.01	0.4825	0.7149
70	2.328	-2.285	6.621	0.374	6.247	1.5711	1.0892

注: 1. 以上象差值计算时, 未考虑滤色片。

2. 滤色片的基底玻璃是K9, $d = 4.3$ 。



编号: 07-02-018

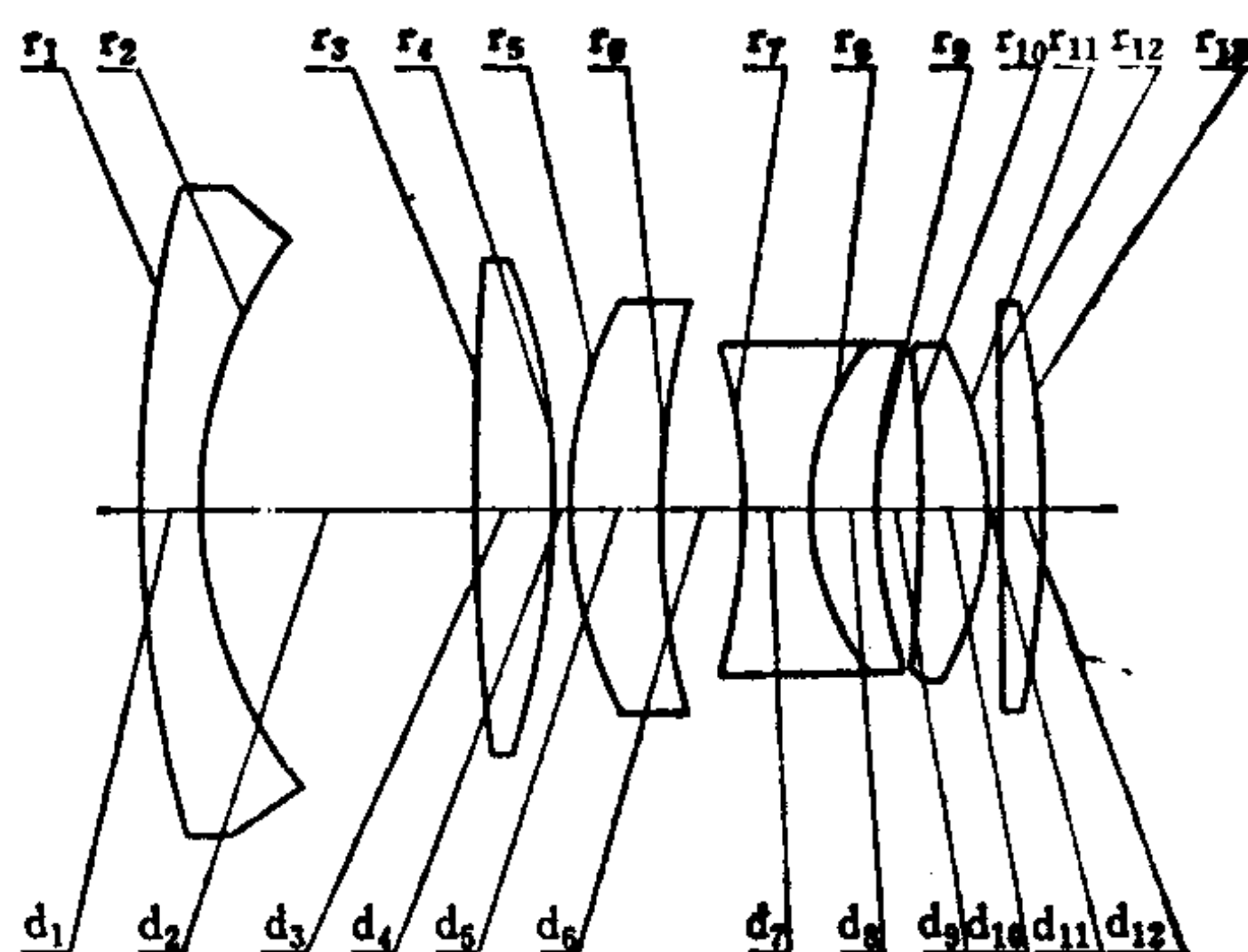
广 角 物 镜

E. F. L = 100

B. F. L = 105.7

FNo. = 2.8

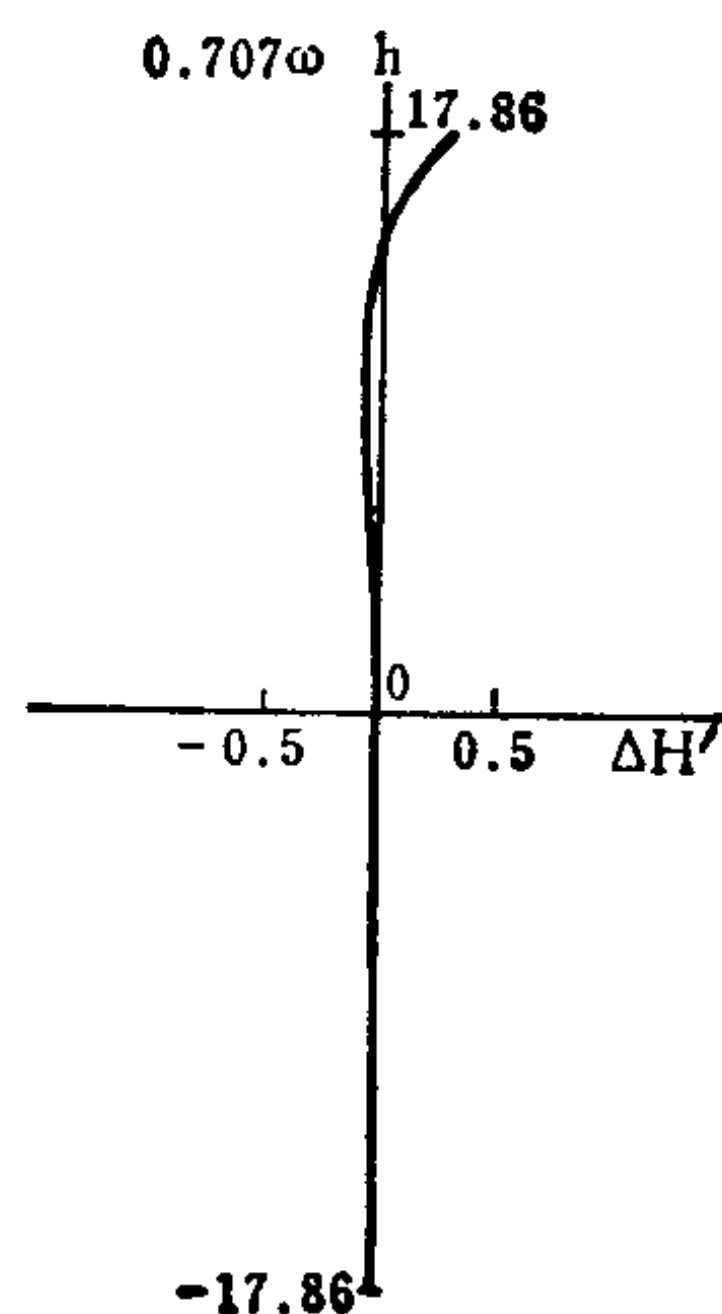
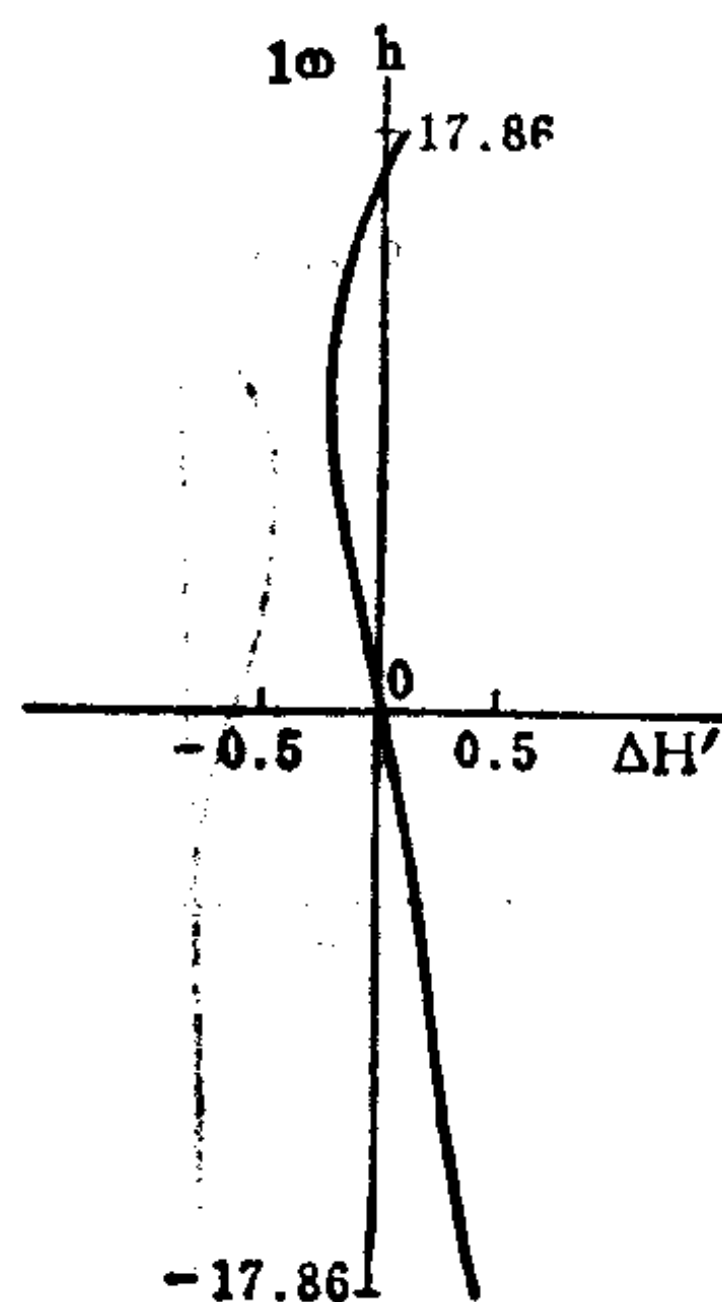
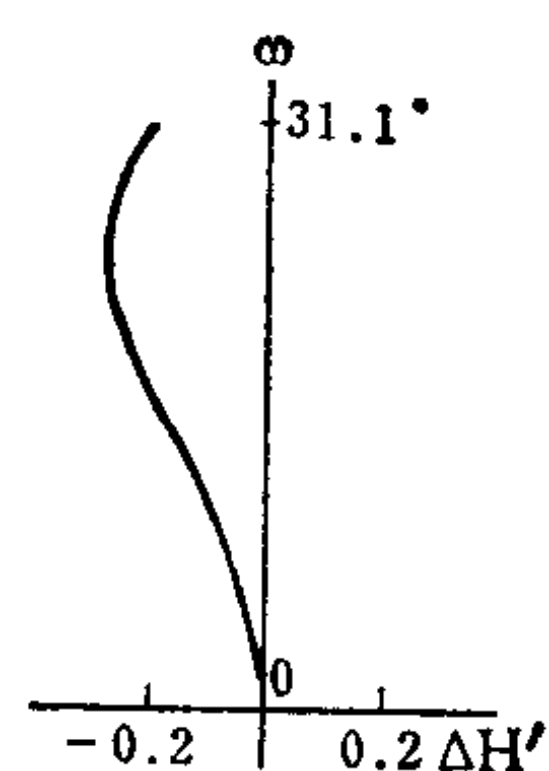
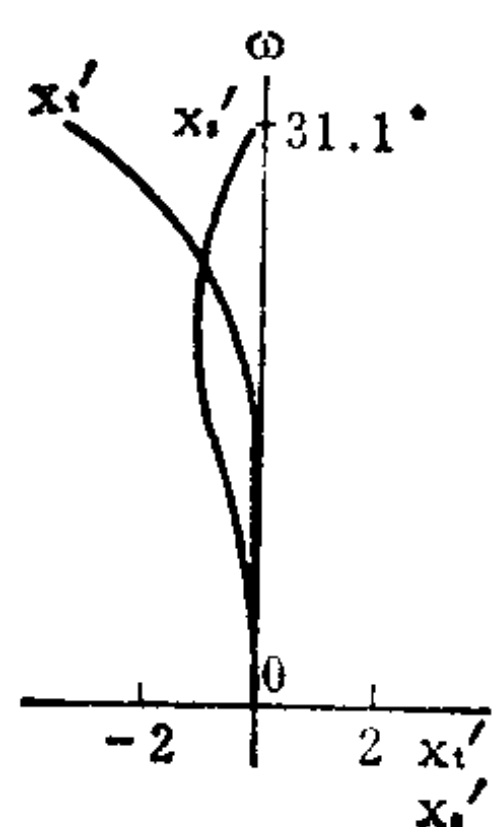
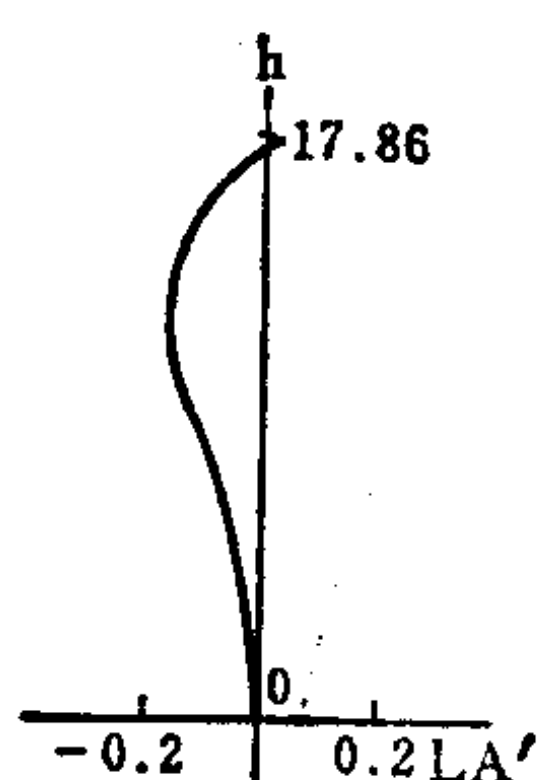
F. A. = $\pm 31.1^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	311.1	8.3	1.6425	58.4	8	56.5	10.2	1.6700	51.6
2	74.9	51.3			9	121.9	5.5		
3	1041.7	13.9	1.8061	40.8	10	-462.8	13.3	1.6935	50.8
4	-138.6	1.1			11	-67.1	0.6		
5	71.4	16.2	1.8044	39.6	12	4166.6	8.3	1.7440	44.8
6	127.6	14.7*			13	-175.0			
7	-108.3	14.3	1.7618	26.6					

14.7* = 7.7 + 7.0

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.0369	-0.0270	0.0500	-0.2006	-0.3405	60.3	-0.3%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.0365	-0.1909	-3.511	-0.195	-3.316	0.2570	0.0633
70	-0.1668	-0.2765	-0.594	-0.843	0.249	0.1233	-0.0212



编号: 07-02-019

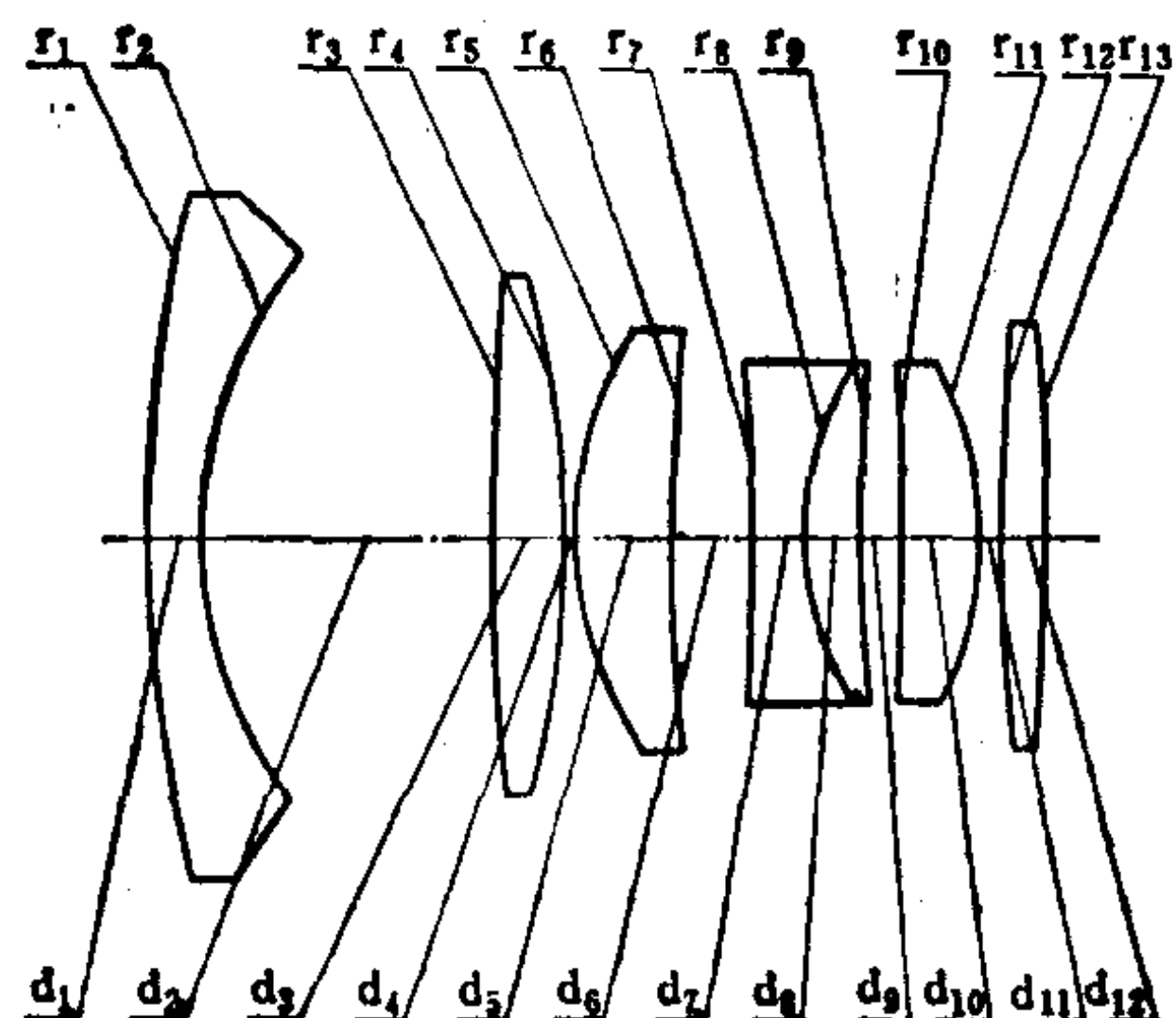
广 角 物 镜

E. F. L = 99.8

B. F. L = 103.4

FNo. = 2.8

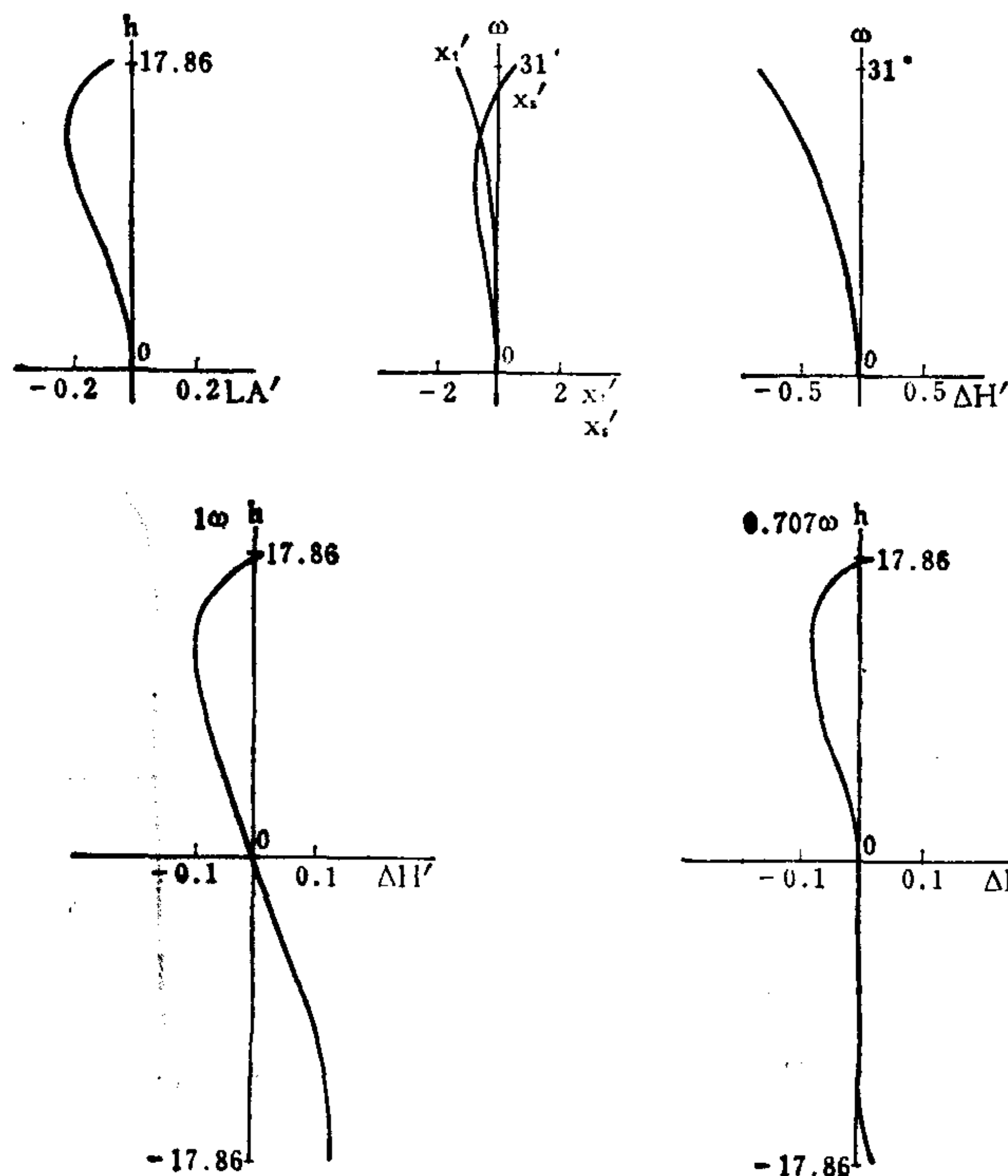
F. A. = $\pm 31^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	308.2	8.3	1.6425	58.4	8	55.7	10.9	1.6700	51.6
2	71.3	51.4			9	111.9	5.5		
3	754.2	13.9	1.8061	40.8	10	-644.8	12.8	1.6779	50.7
4	-139.5	1.0			11	-64.0	2.9		
5	65.5	16.8	1.8061	40.8	12	373.4	8.7	1.7725	49.6
6	102.4	14.8*			13	-386.3			
7	-112.9	9.7	1.7618	26.6					

14.8* = 7.7 + 7.1

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.0425	-0.0291	0.0344	-0.1722	-0.4302	59.9	-1.3%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.0689	-0.7812	-1.269	0.364	-1.633	0.0708	0.0182
70	-0.2140	-0.4168	-0.369	-0.656	0.287	0.0276	-0.0392



编号: 07-02-020

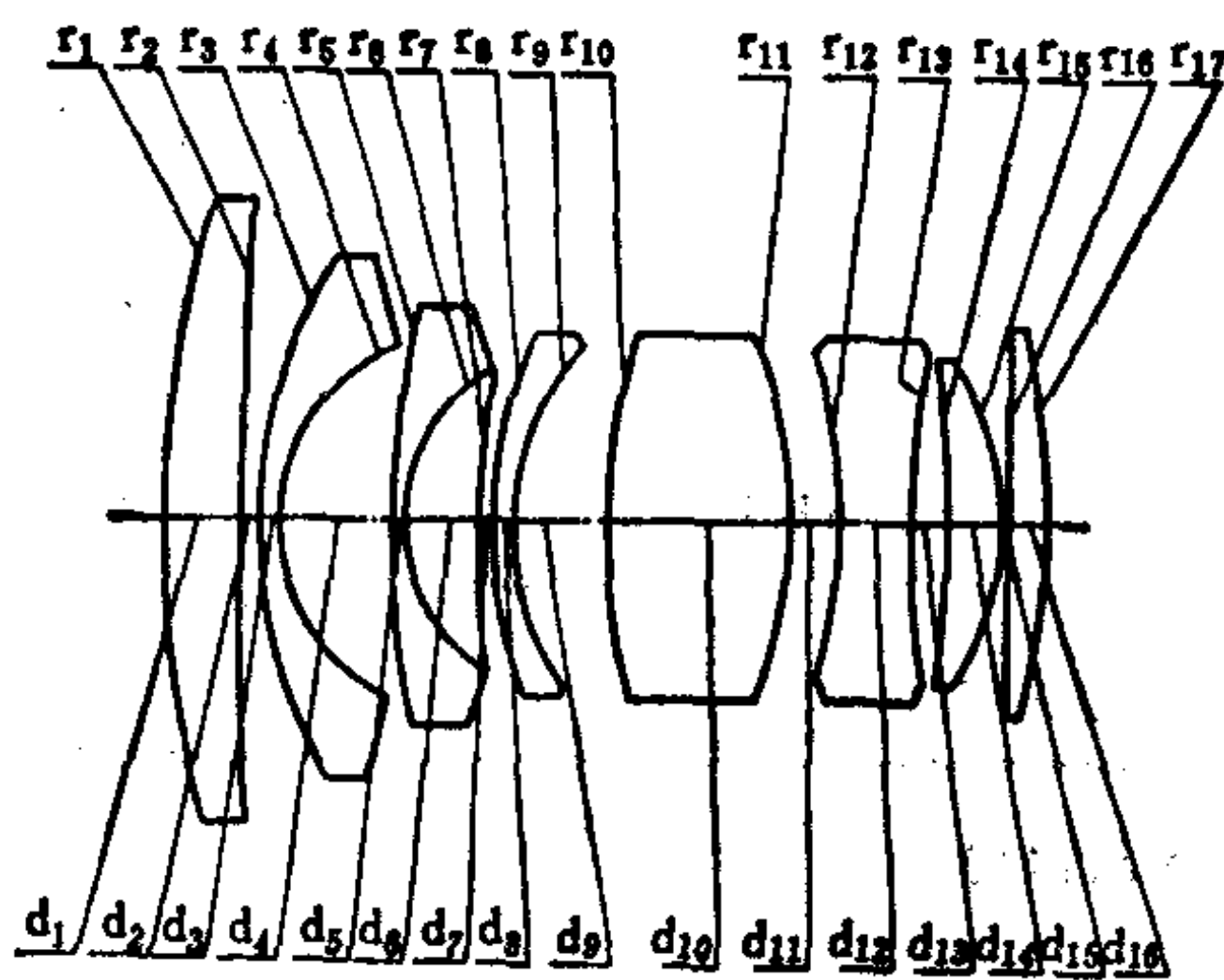
广 角 物 镜

E. F. L = 100

B. F. L = 166.5

FNo. = 2.8

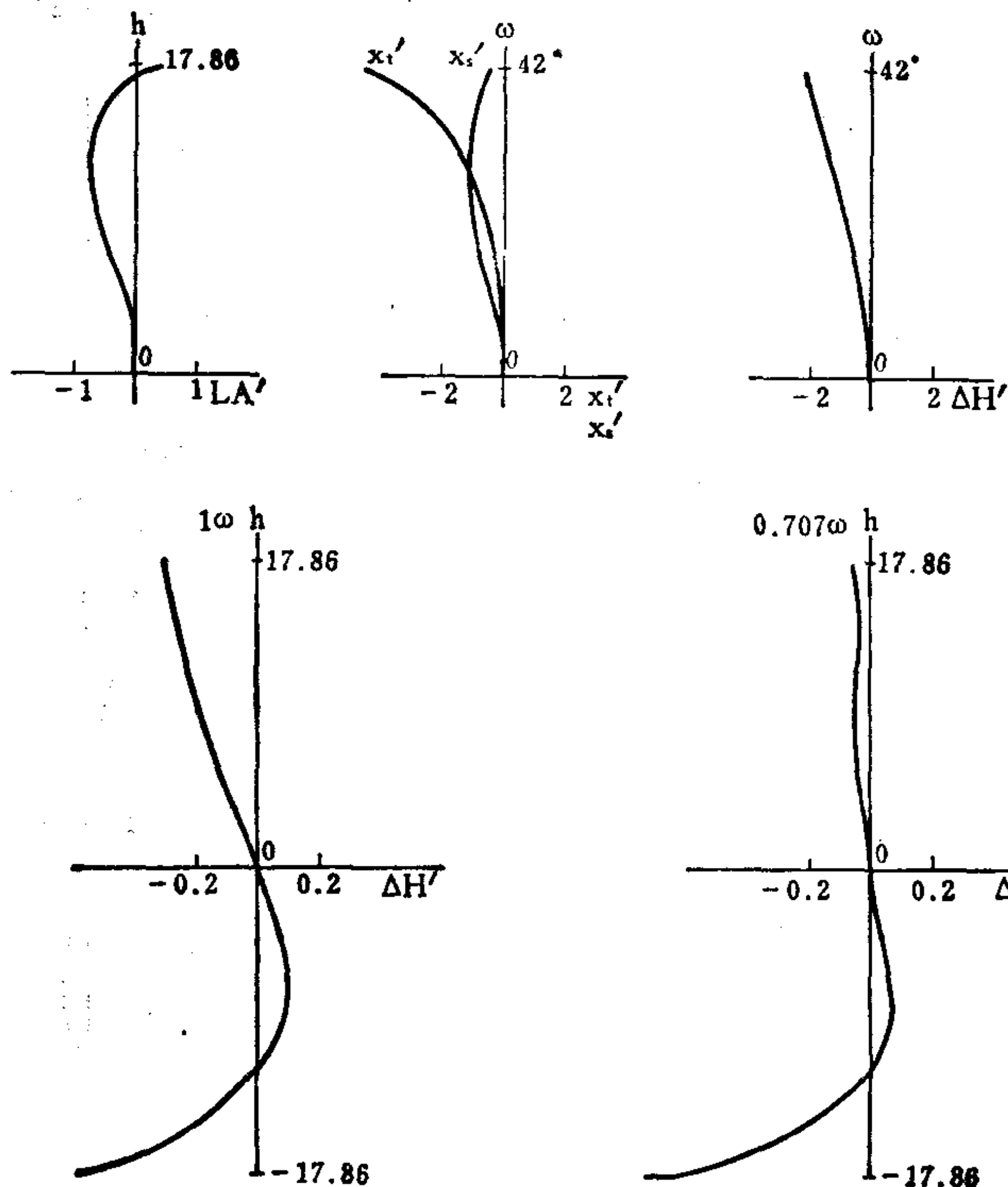
F. A. = $\pm 42^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	246.8	19.2	1.71300	54.0	10	113.5	43.2	1.7432	49.4
2	604.7	0.4			11	-91.2	10.7*		
3	103.5	6.1	1.62041	60.3	12	-126.2	16.0	1.80518	25.4
4	43.6	23.1			13	171.9	5.5		
5	183.0	4.1	1.78590	44.2	14	-563.0	14.3	1.52307	58.4
6	47.5	15.8	1.67270	32.1	15	-65.3	0.4		
7	172.8	2.0			16	34680.0	10.8	1.6968	55.7
8	111.4	5.3	1.6425	58.4	17	-146.9			
9	53.0	18.5							

10.7* = 5.0 + 5.7

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.1880	0.1907	-0.1375	-0.1549	-0.9945	90	-2.3%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K_{T1}	$K'_{T0.7}$
100	0.4666	-2.0733	-4.566	-0.437	-4.129	-0.4352	-0.1398
70	-0.7306	-1.3438	-1.253	-1.068	-0.185	-0.3883	-0.0362



编号: 07-02-021

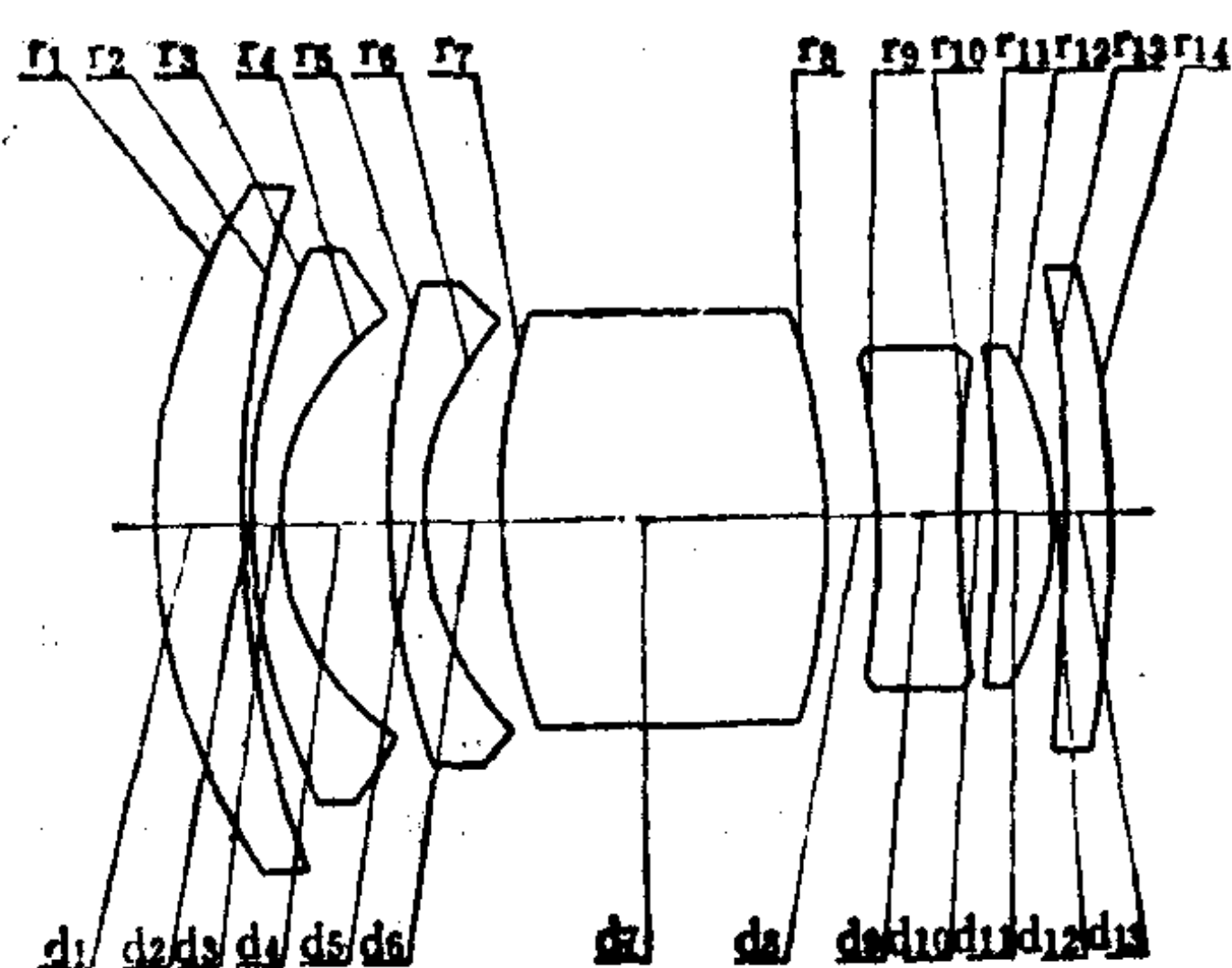
体积小的反远距型广角物镜

E.F.L = 100

B.F.L = 134.05

FNo. = 3.5

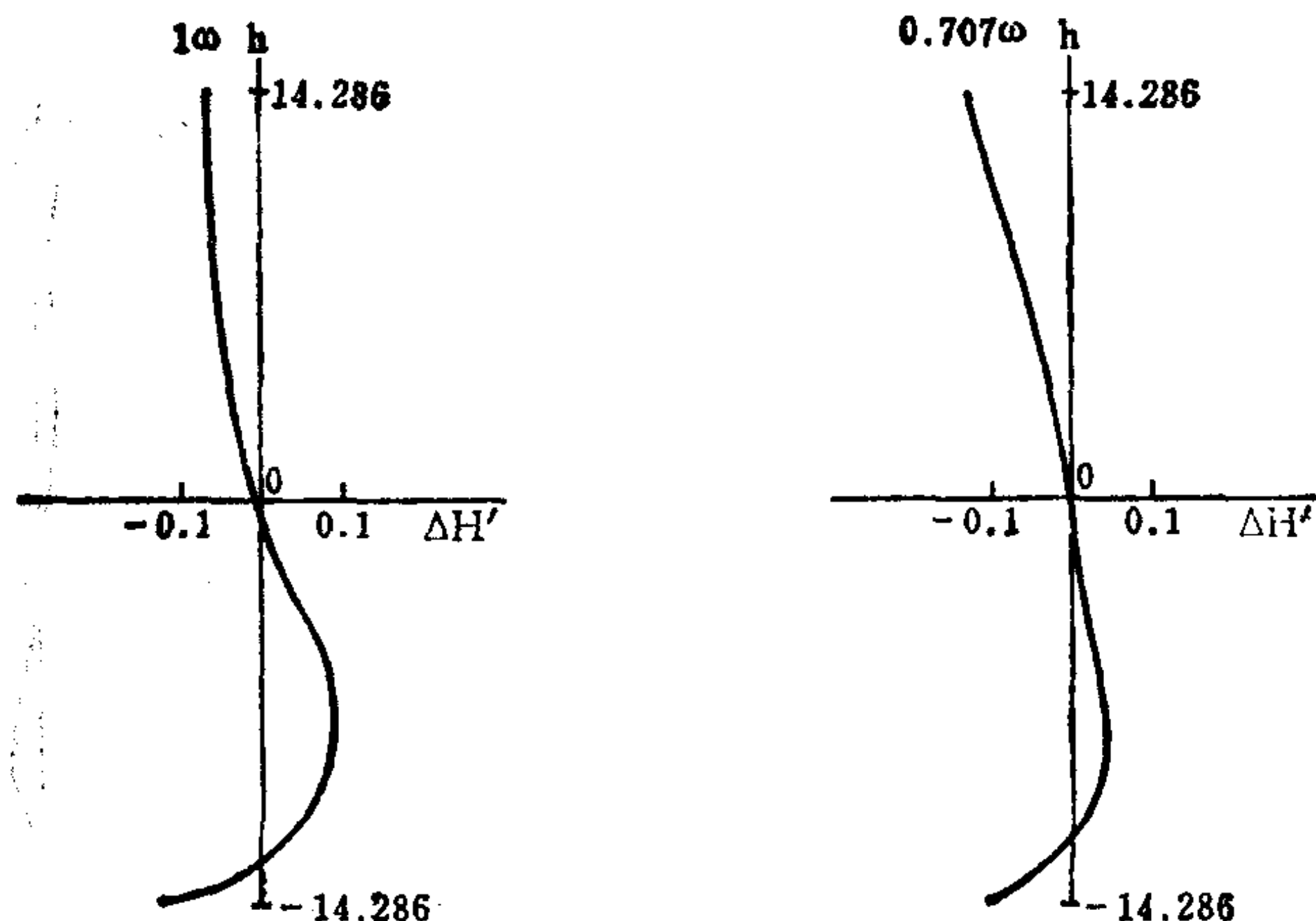
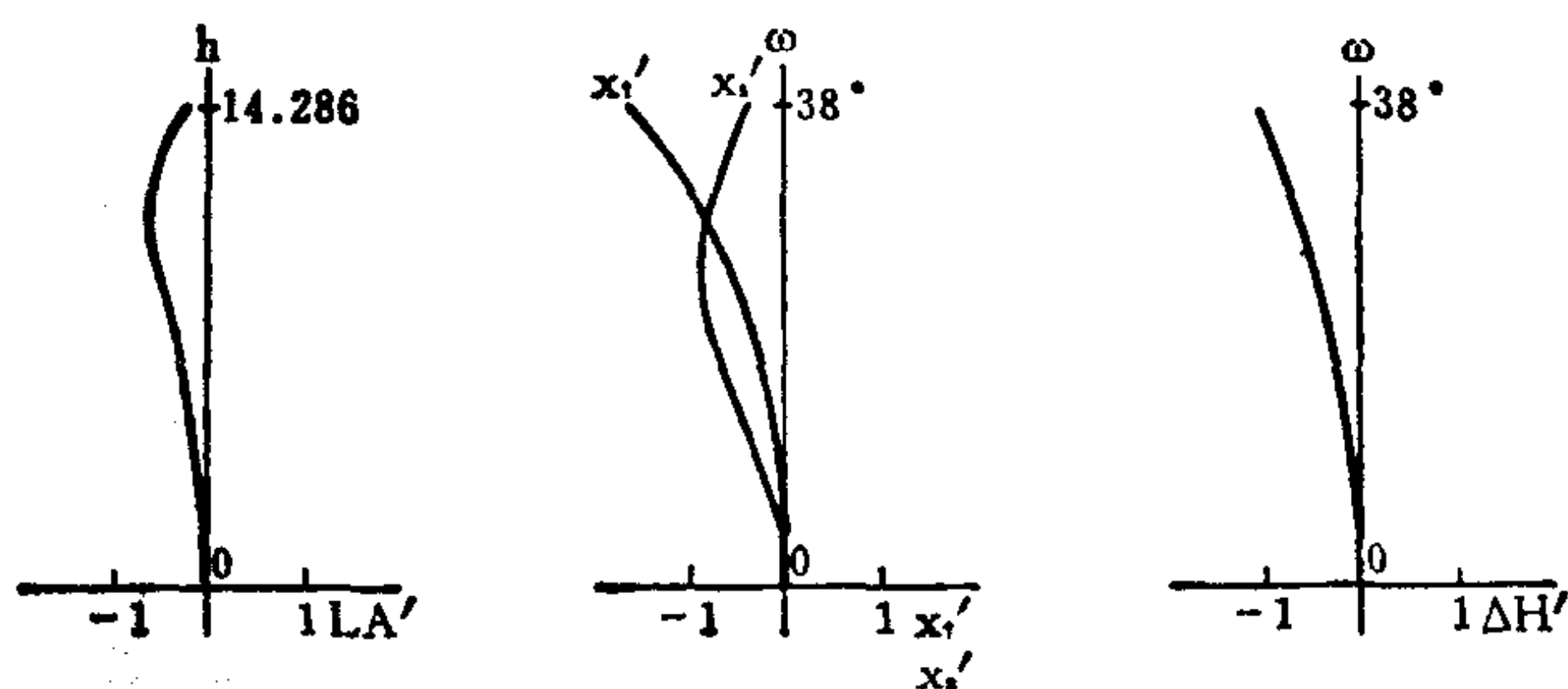
F.A. = $\pm 38^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	87.306	14.2800	1.72000	42.08	8	-73.327	7.1410*		
2	162.911	0.3570			9	-76.694	10.9260	1.76180	27.11
3	97.551	5.3560	1.58913	61.11	10	230.504	4.6060		
4	36.310	14.6000			11	-143.783	8.9270	1.69680	55.62
5	114.111	5.3560	1.58913	61.11	12	-50.050	0.5360		
6	39.524	11.2830			13	-1724.112	7.8550	1.56873	63.16
7	78.687	48.7750	1.67790	53.36	14	-113.904			

$$7.1410^* = 3.0000 + 4.1410$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.06559	0.02544	-0.00099	-0.08790	-0.37709	78.1	-1.3%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.2056	-1.008	-1.749	-0.408	-1.341	-0.10202	0.00940
70	-0.5173	-0.536	-0.732	-0.849	0.117	-0.11355	-0.01558



编号: 07-02-022

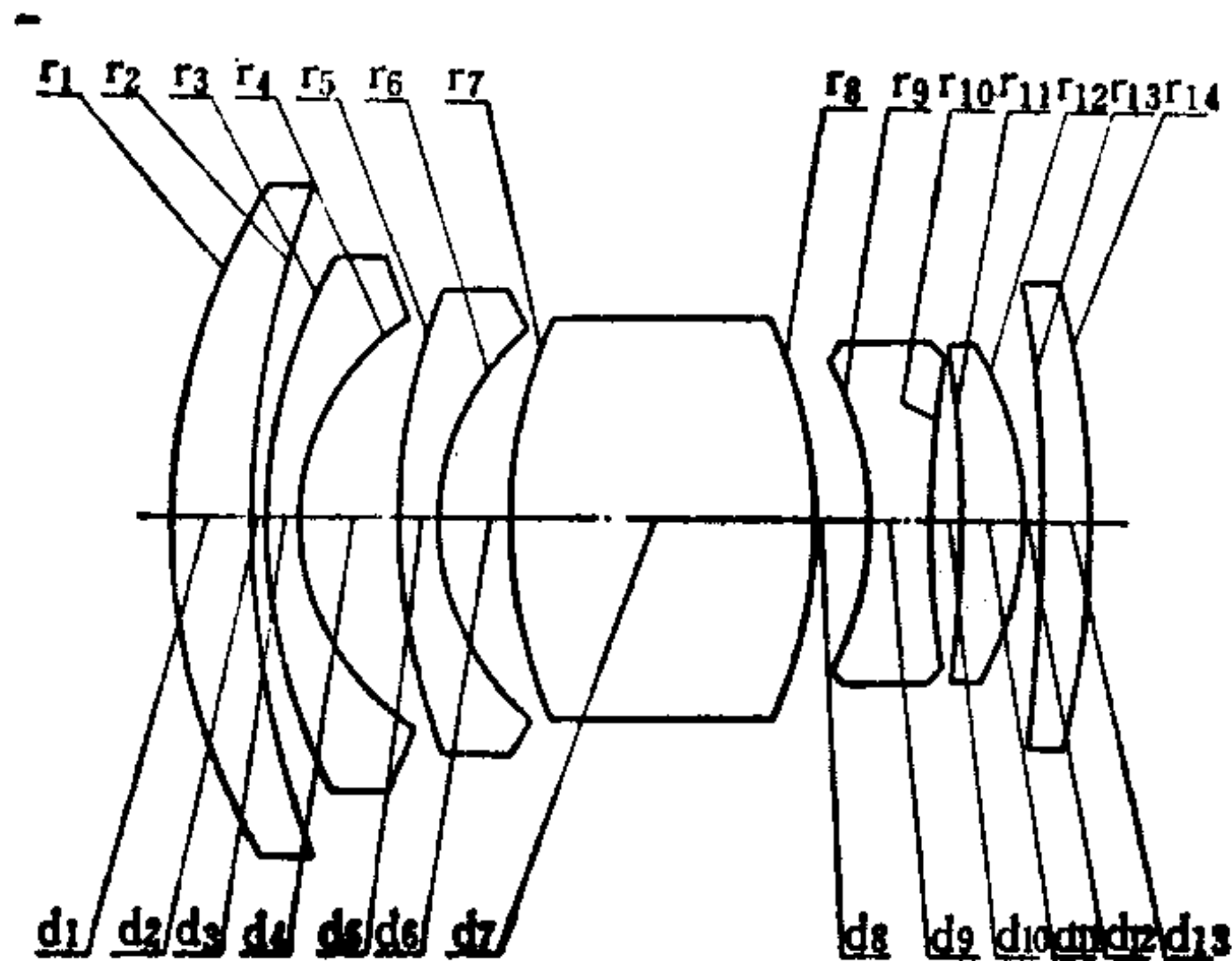
体积小的反远距型广角物镜

E.F.L = 100

B.F.L = 133.96

FNo. = 3.5

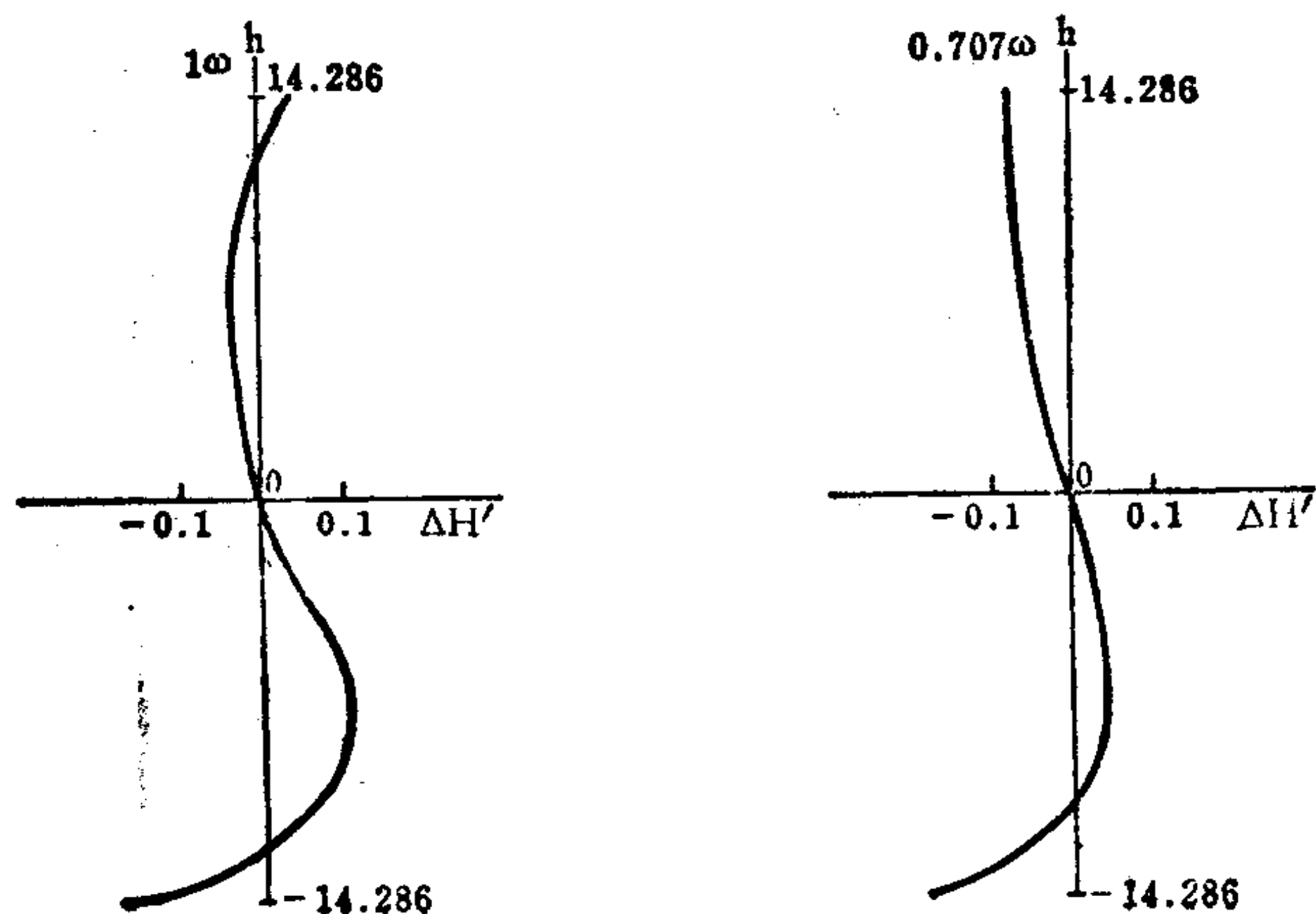
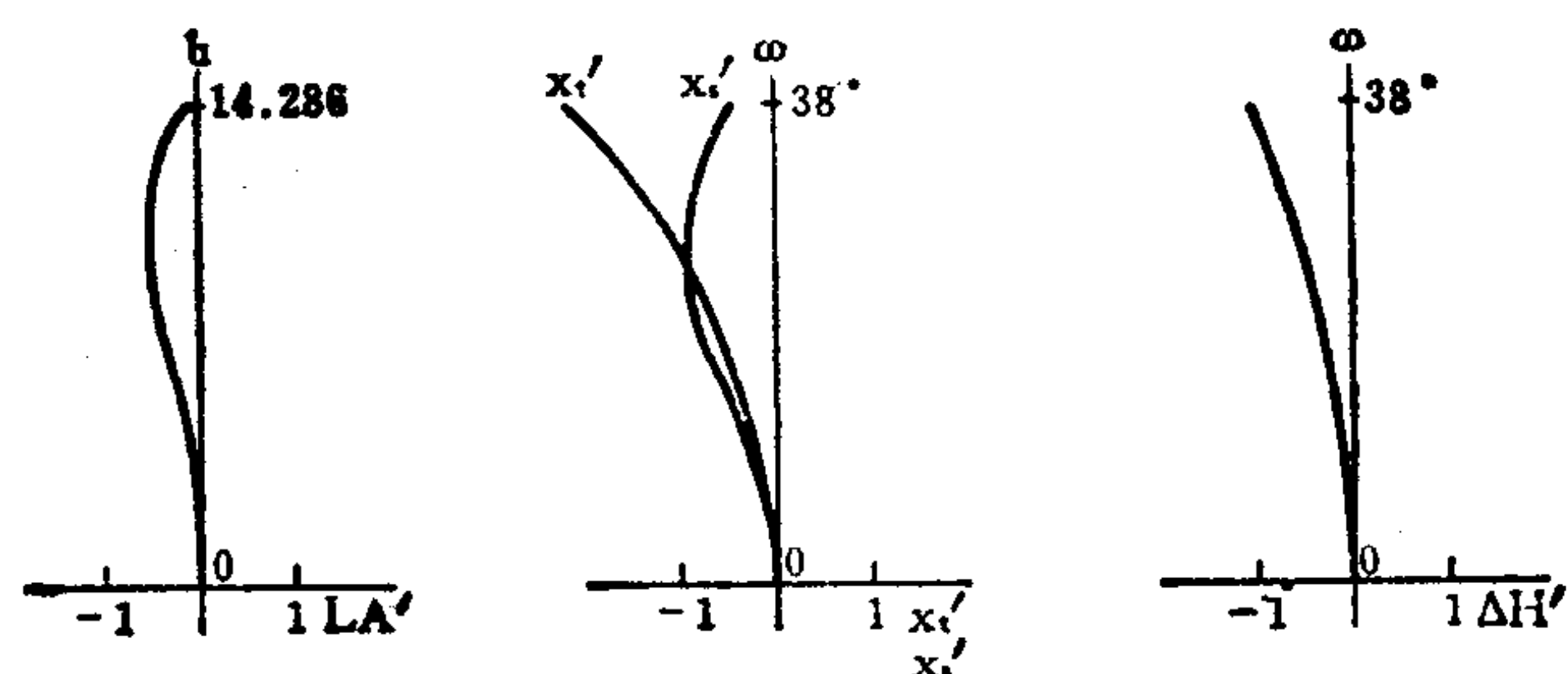
F.A. = $\pm 38^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	96.475	14.29	1.73520	41.08	8	-72.651	7.14*		
2	160.012	0.36			9	-74.912	10.93	1.72825	28.46
3	85.458	5.36	1.50378	66.81	10	193.104	4.61		
4	35.556	14.61			11	-170.430	8.93	1.64000	60.25
5	109.514	5.36	1.64000	60.25	12	-46.484	0.54		
6	37.124	11.29			13	-943.009	7.86	1.56873	63.16
7	76.508	44.46	1.67790	53.36	14	-117.467			

7.14* = 3.00 + 4.14

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.06872	0.01688	-0.00439	-0.08783	-0.36350	78.1	-1.27%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.1063	-0.995	-2.178	-0.374	-1.804	-0.07689	0.03069
70	-0.5277	-0.523	-0.989	-0.916	-0.073	-0.13219	-0.02412



编号: 07-02-023

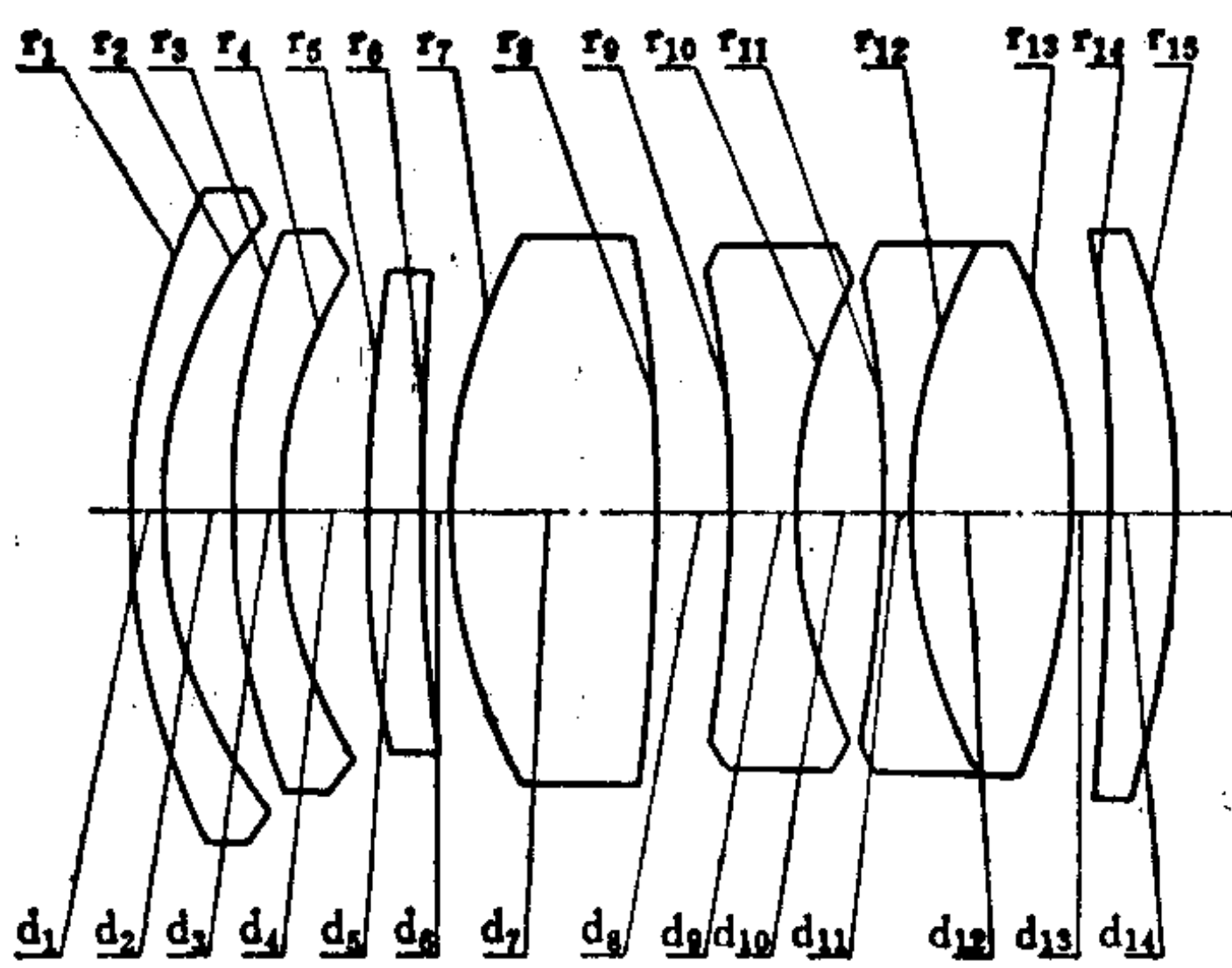
准 广 角 大 孔 径 物 镜

E.F.L=99.4

B.F.L=94.9

FN₀. = 1.79

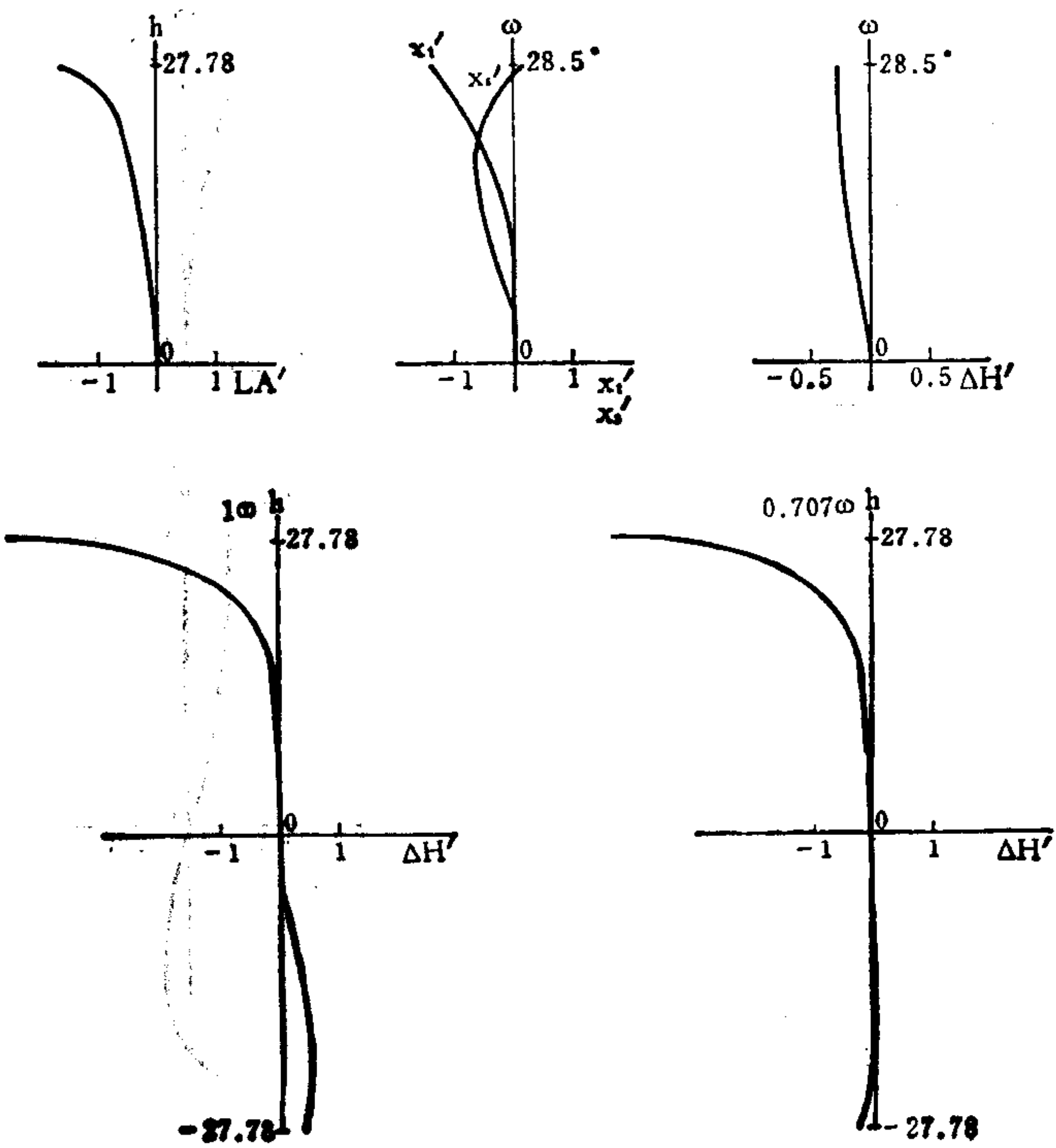
F.A. = ± 28.5°



序号	r	d	n	v	序号	r	d	n	v
1	92.500	3.95	1.51633	64.1	9	-149.500	9.00	1.76182	26.6
2	57.275	9.52			10	68.250	9.67		
3	132.250	5.32	1.69350	53.3	11	-159.375	5.00	1.74077	27.8
4	55.875	9.42			12	80.750	19.20	1.80610	40.8
5	167.500	7.50	1.83400	37.2	13	-79.500	3.75		
6	1537.500	2.50			14	-951.448	8.75	1.78590	44.2
7	68.313	26.50	1.78590	44.2	15	-111.275			
8	-178.523	9.27*							

9.27* = 4.00 + 5.27

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.2623	-0.1323	0.0783	-0.4032	-0.3870	53.9	-0.4%
h 或 ω %	LA'	$\Delta H'$	x'_1	x'_2	$x'_1 - x'_2$	K'_{T1}	$K'_{T0.7}$
100	-1.749	-0.234	-1.337	0.223	-1.560	-2.1169	0.0585
70	-0.550	-0.205	-0.396	-0.656	0.260	-2.3123	-0.2289



编号: 07-02-024

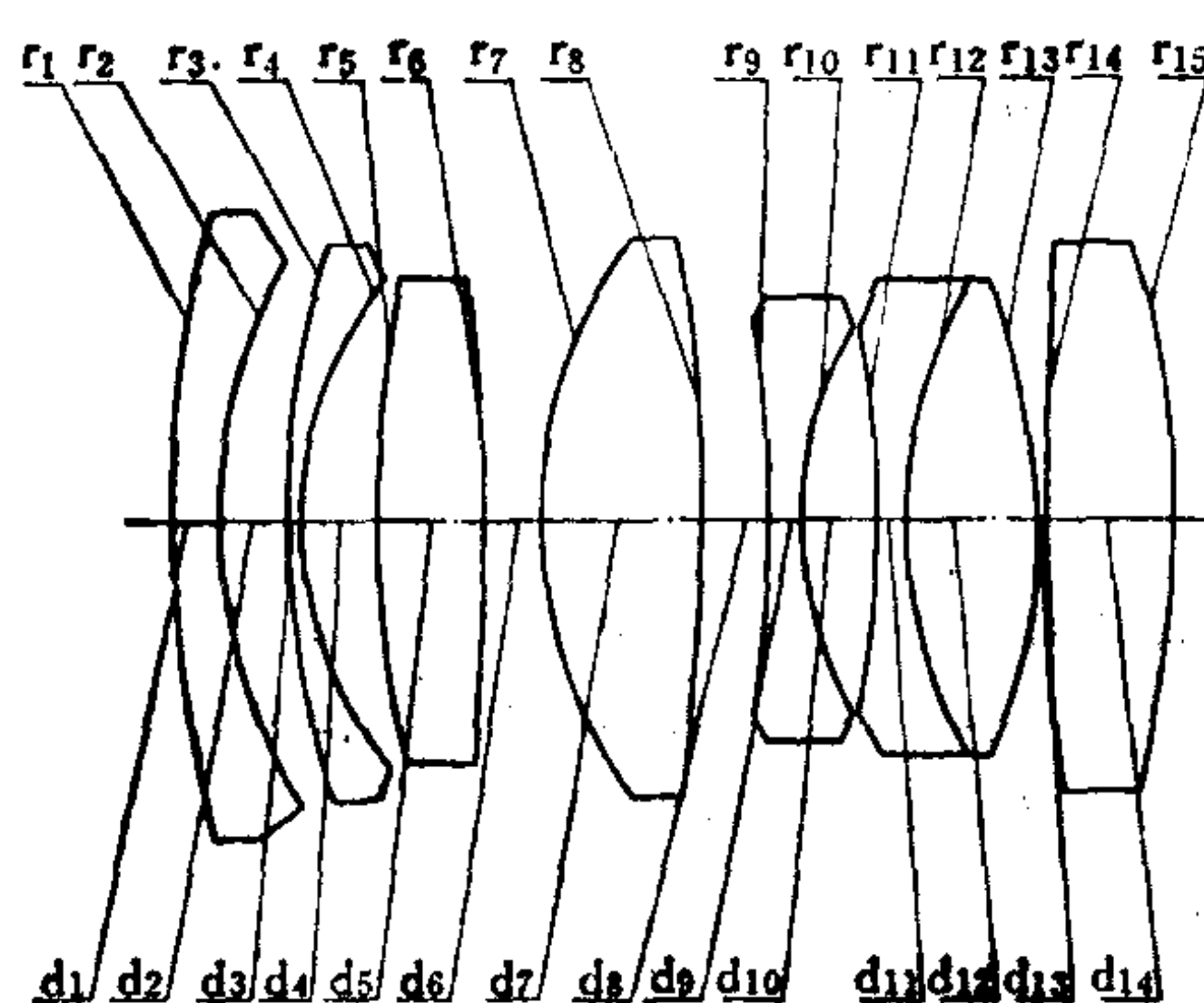
准广角大孔径物镜

E.F.L=100

B.F.L=92.6

FNo.=1.8

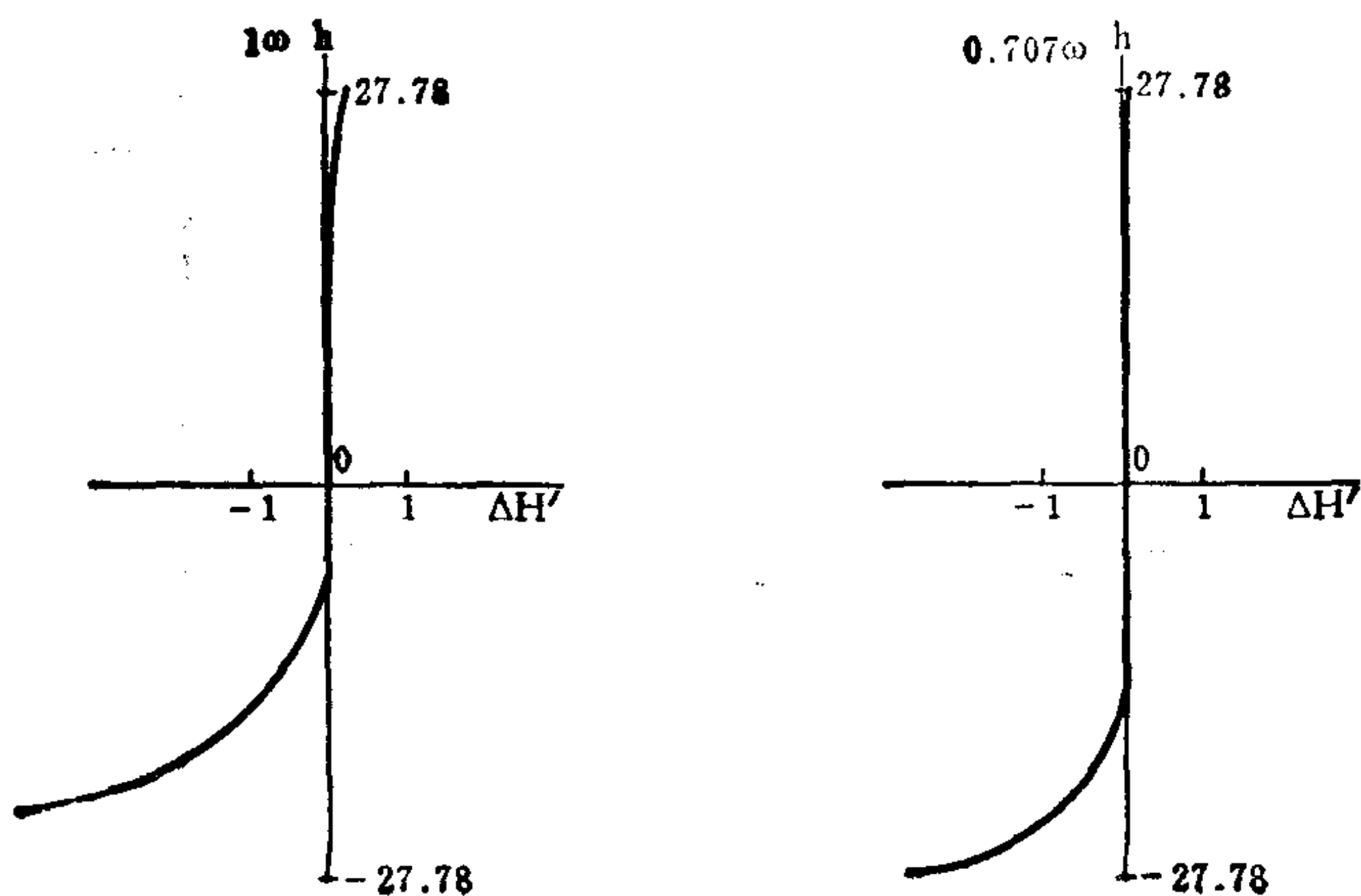
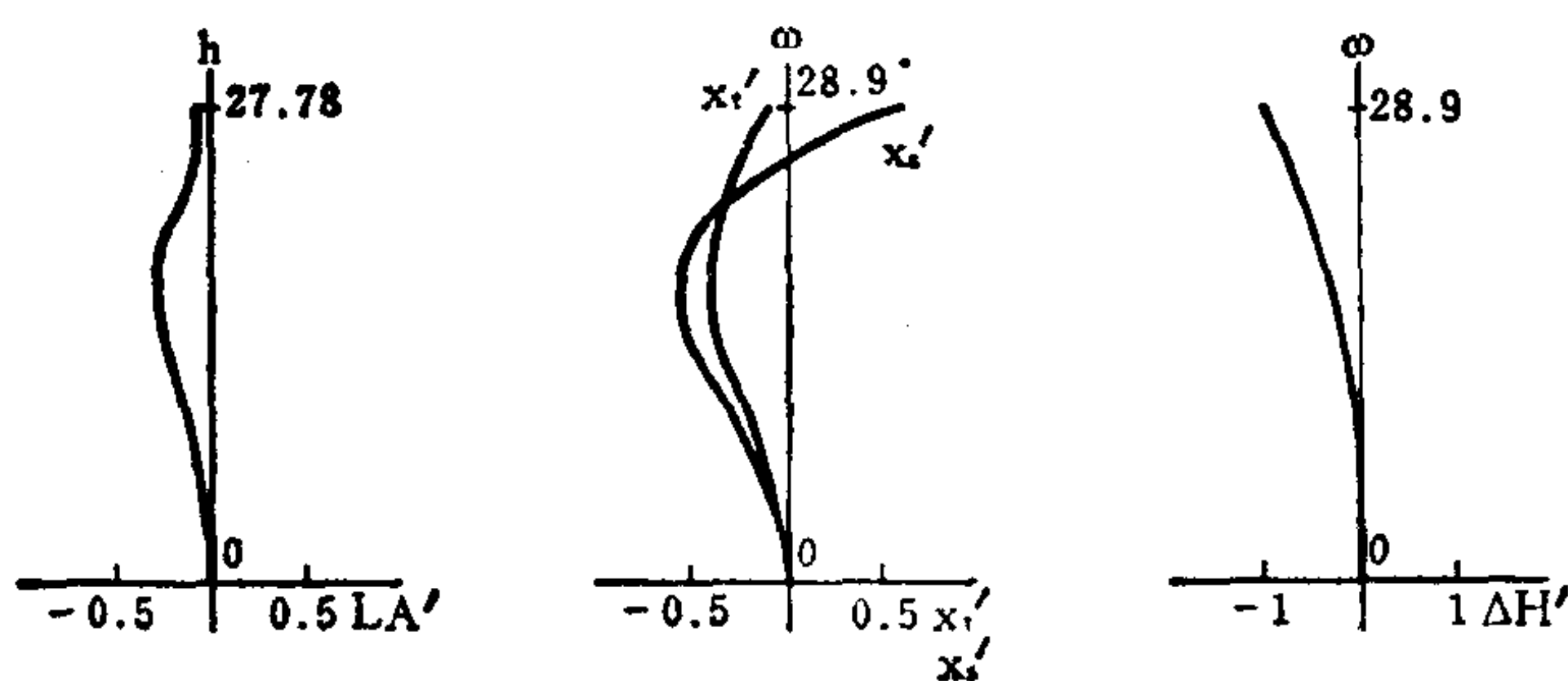
F.A.=±28.9°



序号	r	d	n	v	序号	r	d	n	v
1	175.400	6.90	1.53172	48.9	9	-195.000	6.25	1.72825	28.5
2	73.563	9.42			10	58.013	10.25*		
3	128.468	3.00	1.54072	47.2	11	-176.700	3.75	1.69895	30.1
4	56.023	10.95			12	70.078	18.85	1.78590	44.2
5	168.280	15.37	1.83400	37.2	13	-79.025	0.25		
6	-3453.988	8.27			14	996.250	18.80	1.65830	53.4
7	71.325	23.82	1.79952	42.3	15	-155.585			
8	-246.250	9.05							

10.25° = 5.00 + 5.25

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	H	QP (1ω)
/	-0.2012	0.0809	0.0043	-0.3189	-0.5285	55.25	-1.8%
h 或 ω %	LA'	ΔH'	x _t '	x _s '	x _t ' - x _s '	K _{T1}	K _{T0.7}
100	-0.0611	-0.999	-0.1125	0.6208	-0.7333	-5.1149	-0.9011
70	-0.2504	-0.396	-0.3790	-0.5437	0.1647	-1.3155	-0.1206



编号: 07-02-025

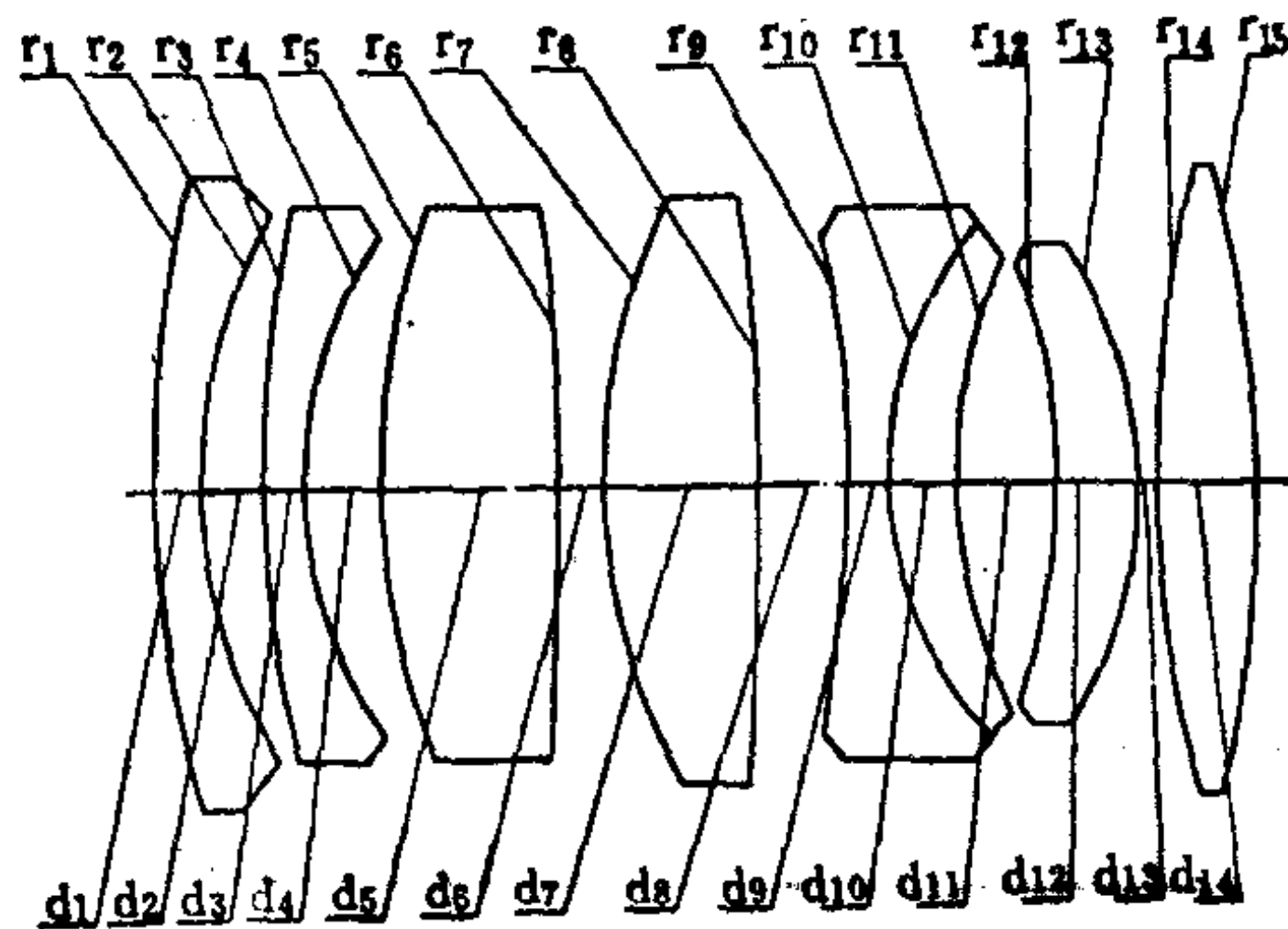
准 广 角 大 孔 径 物 镜

E.F.L=100

B.F.L=93.3

FNo.=1.8

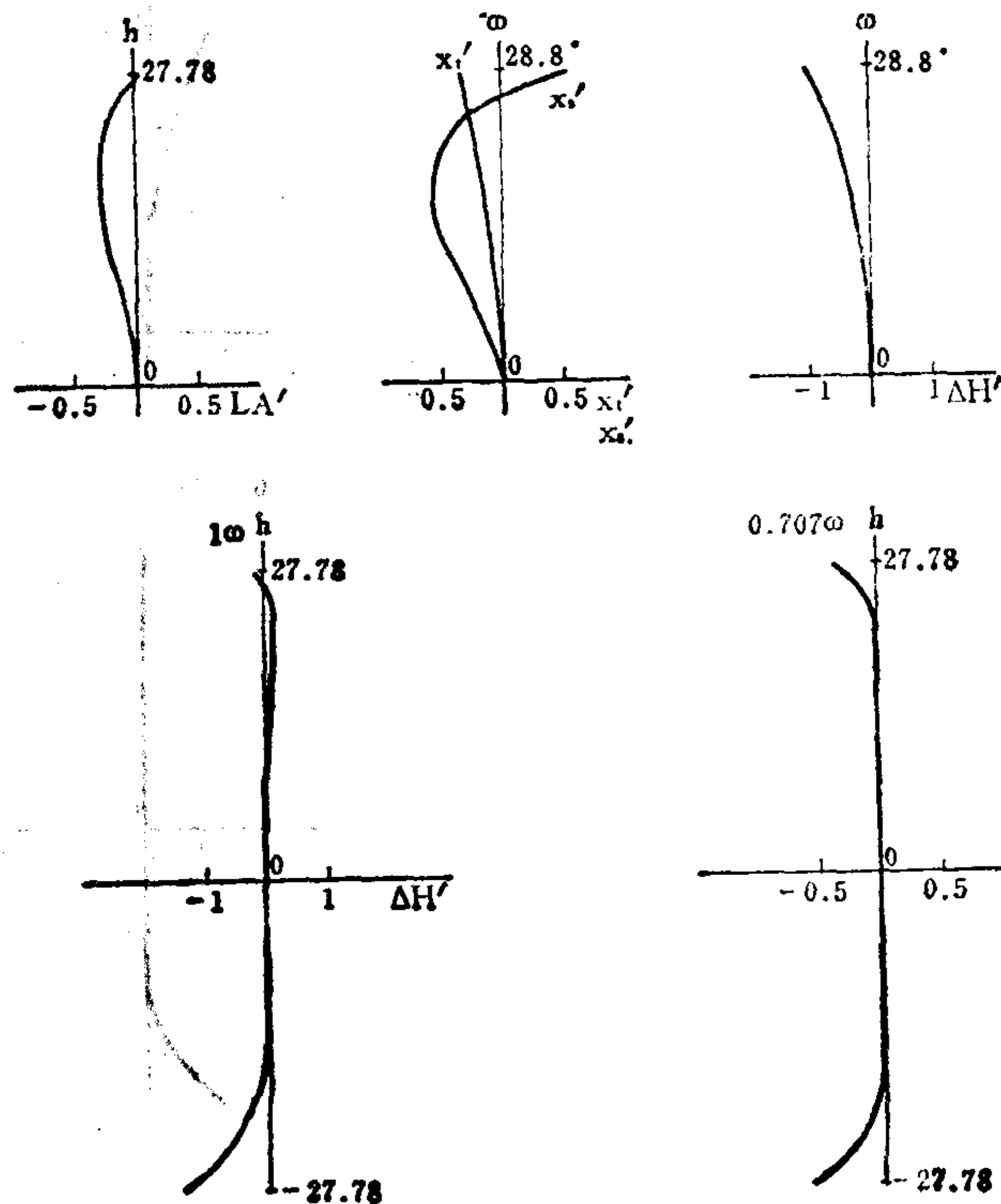
F.A.=±28.8°



序号	r	d	n	v	序号	r	d	n	v
1	217.623	6.17	1.49782	66.8	9	-215.345	5.00	1.84666	23.9
2	69.596	9.20			10	57.528	9.77	1.78800	47.5
3	234.650	4.75	1.51454	54.7	11	79.998	13.67		
4	64.373	12.02			12	-87.823	10.60	1.77250	49.6
5	108.900	23.57	1.83400	37.2	13	-62.057	0.25		
6	-34888.149	6.52			14	182.638	14.45	1.81600	46.8
7	91.838	21.75	1.78800	47.5	15	-229.152			
8	-269.731	12.27*							

$$12.27^* = 6.00 + 6.27$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.1770	0.0367	0.0823	-0.3721	-0.5173	54.9	-1.8%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.0393	-0.973	-0.292	0.543	-0.835	-0.7582	-0.0542
70	-0.3092	-0.360	-0.219	-0.546	0.327	-0.4398	-0.0255



编号: 07-02-026

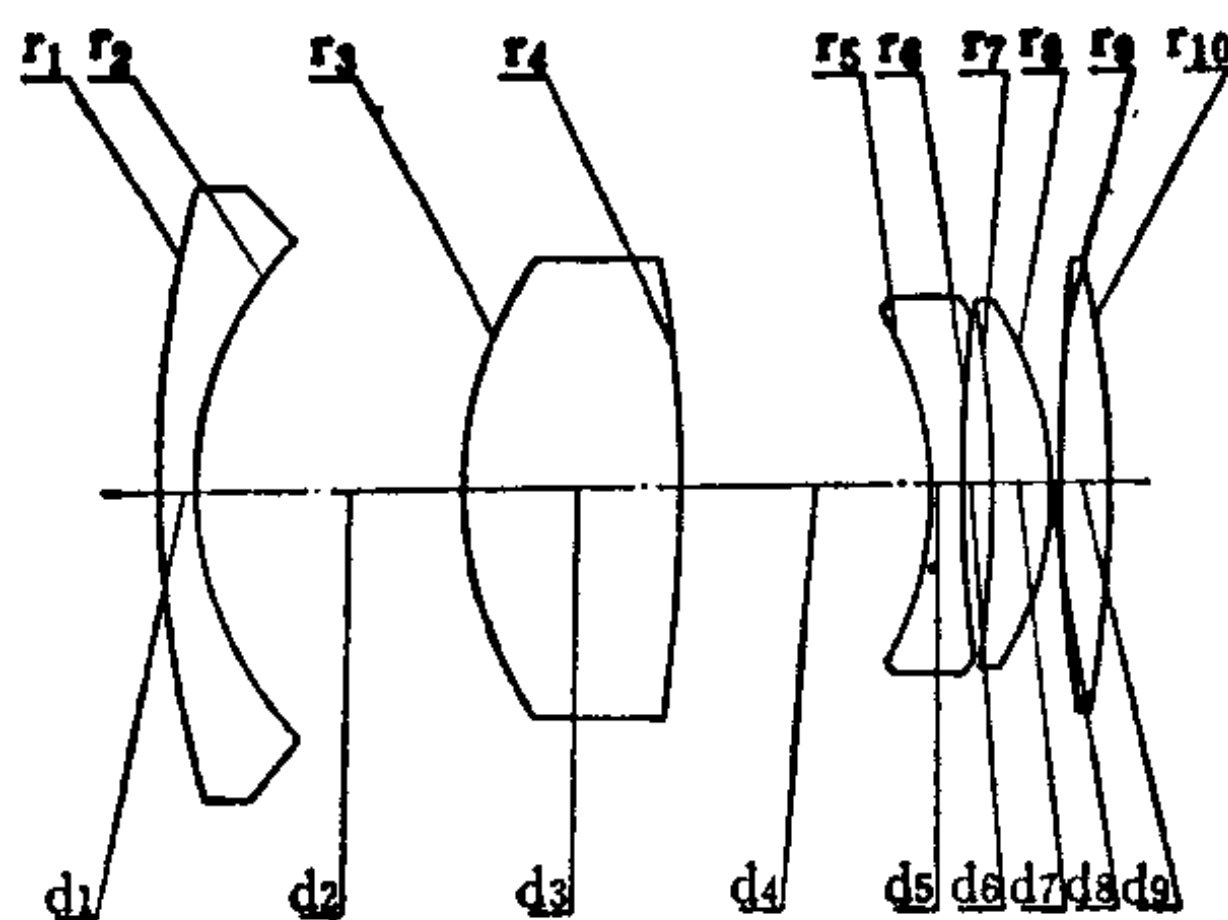
五片式反远距型广角物镜

E.F.L=1

B.F.L=1.06

FNo.=2.8

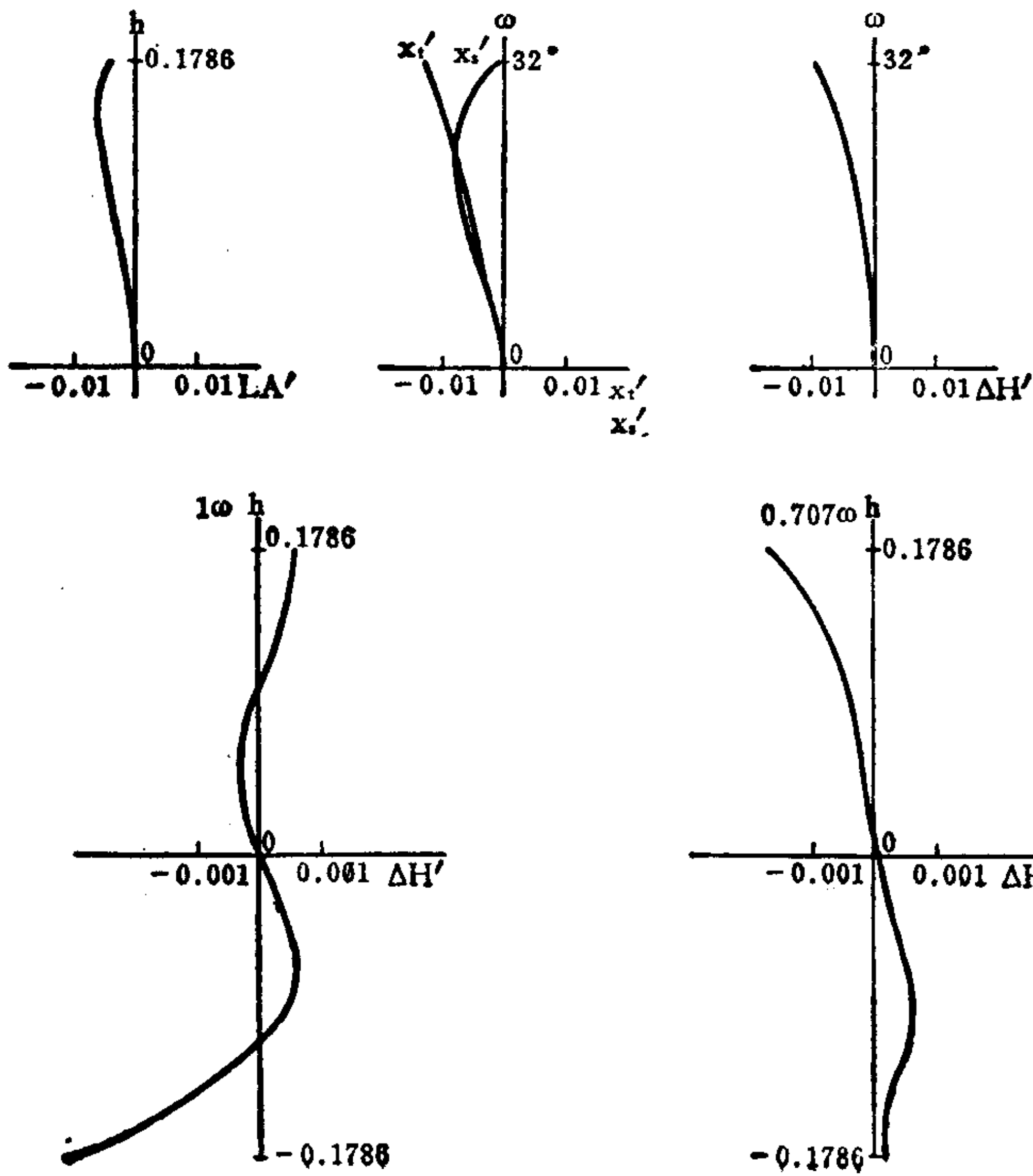
F.A.=±32°



序号	r	d	n	v	序号	r	d	n	v
1	2.3437	0.0441	1.5714	53.0	6	2.3930	0.0283		
2	0.4709	0.3538			7	-1.4595	0.0670	1.7200	50.3
3	0.6206	0.2800	1.6583	58.5	8	-0.4496	0.0029		
4	-1.8643	0.3182*			9	2.4019	0.0680	1.6204	60.3
5	-0.4012	0.0379	1.6889	31.2	10	-1.1931			

$0.3182^* = 0.1600 + 0.1582$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.000909	-0.000031	0.000184	-0.001549	-0.004084	0.62	-1.4%
h 或 ω %	LA'	$\Delta H'$	x'_1	x'_2	$x'_1 - x'_2$	K'_{T1}	$K'_{T0.7}$
100	-0.00375	-0.00879	-0.01320	0.00012	-0.01332	-0.00148	-0.00062
70	-0.00517	-0.00421	-0.00766	-0.00774	0.00008	-0.00078	-0.00020



编号: 07-02-027

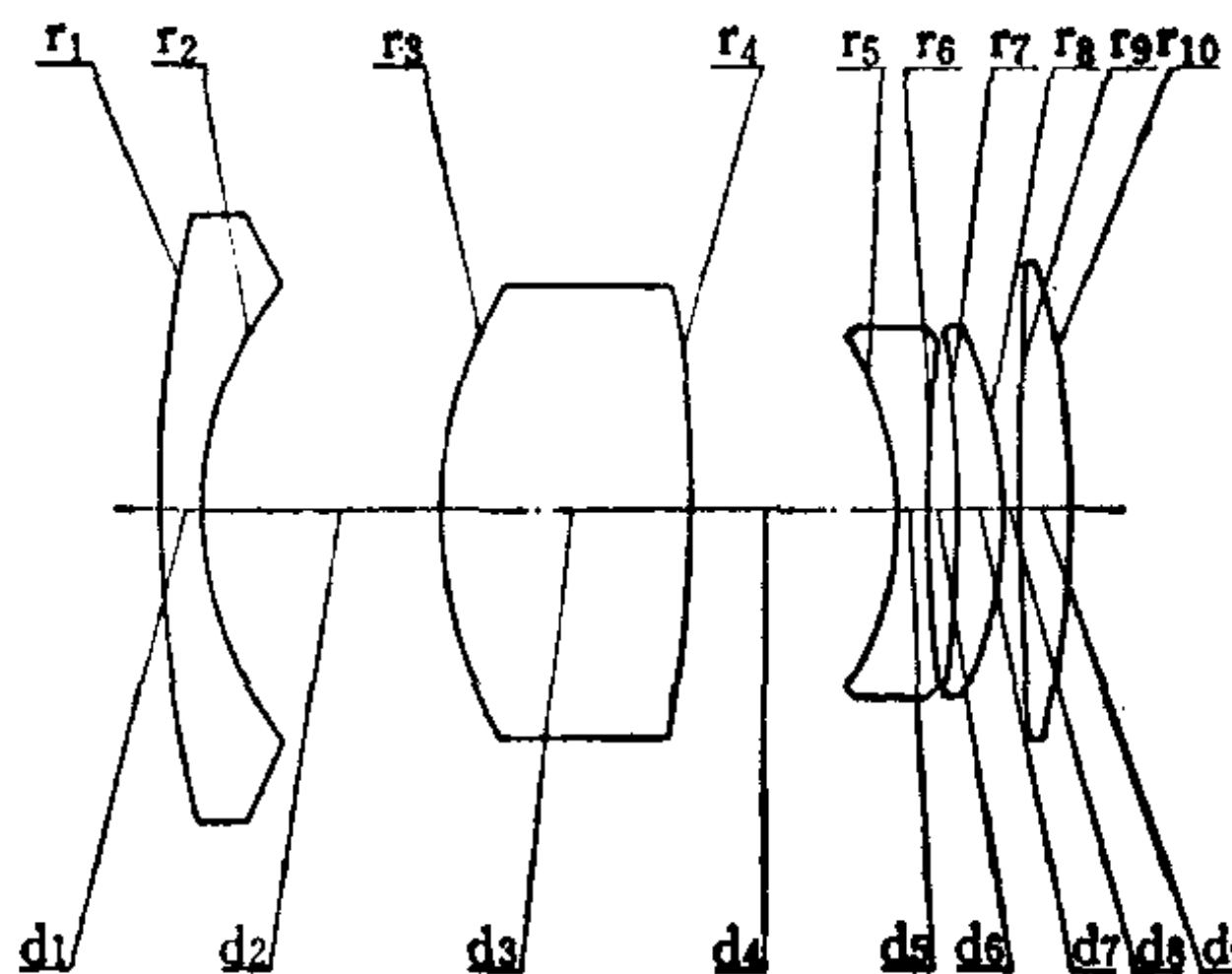
五片式反远距型广角物镜

E.F.L=1

B.F.L=1.06

FNo.=2.8

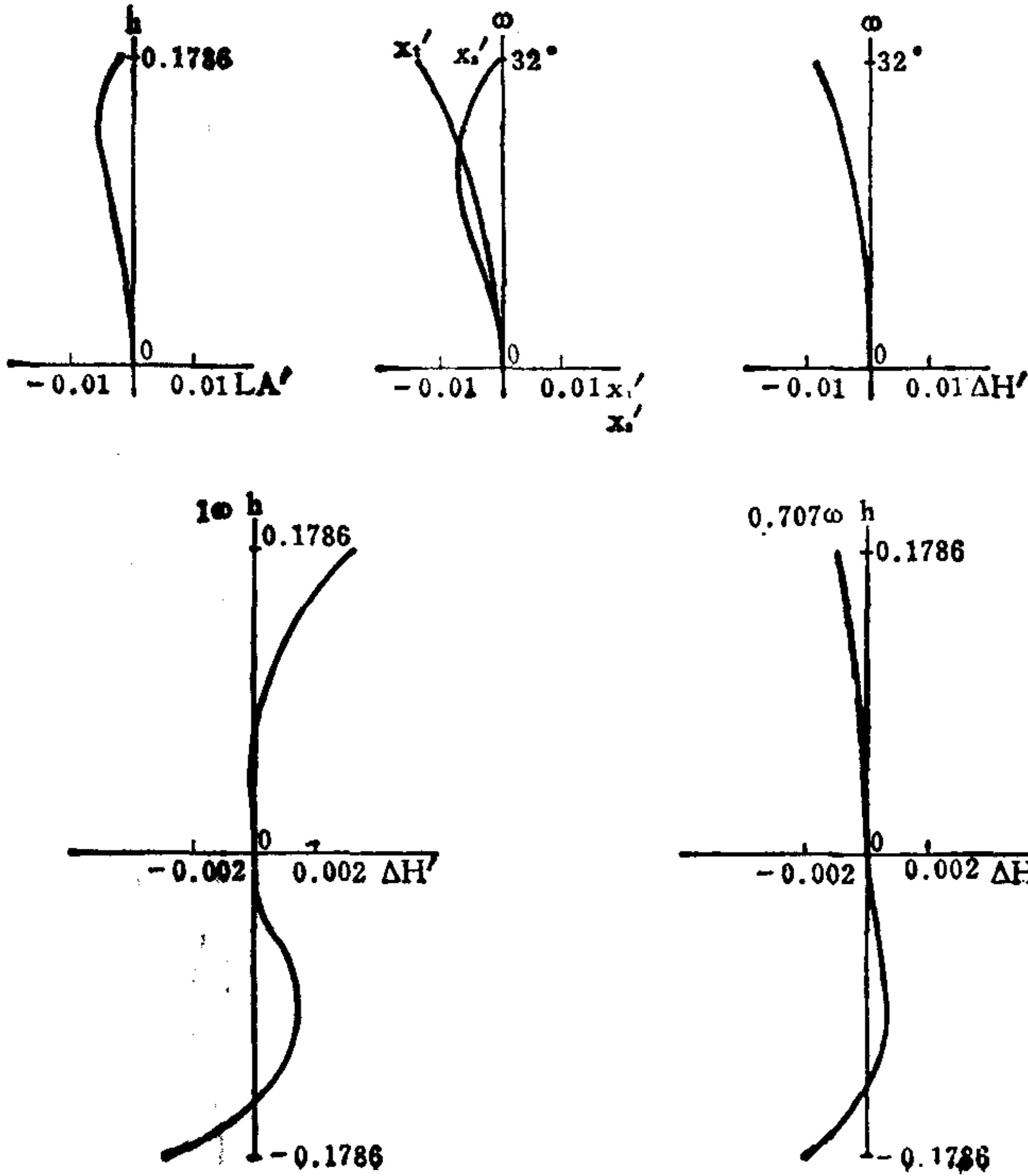
F.A.=±32°



序号	r	d	n	v	序号	r	d	n	v
1	2.5414	0.0469	1.5725	57.5	6	2.1911	0.0376		
2	0.4915	0.3284			7	-1.9373	0.0670	1.7495	50.1
3	0.6600	0.3345	1.6968	55.6	8	-0.4795	0.0029		
4	-1.8698	0.2722*			9	4.3712	0.0680	1.6214	61.3
5	-0.4287	0.0428	1.7006	30.1	10	-1.1652			

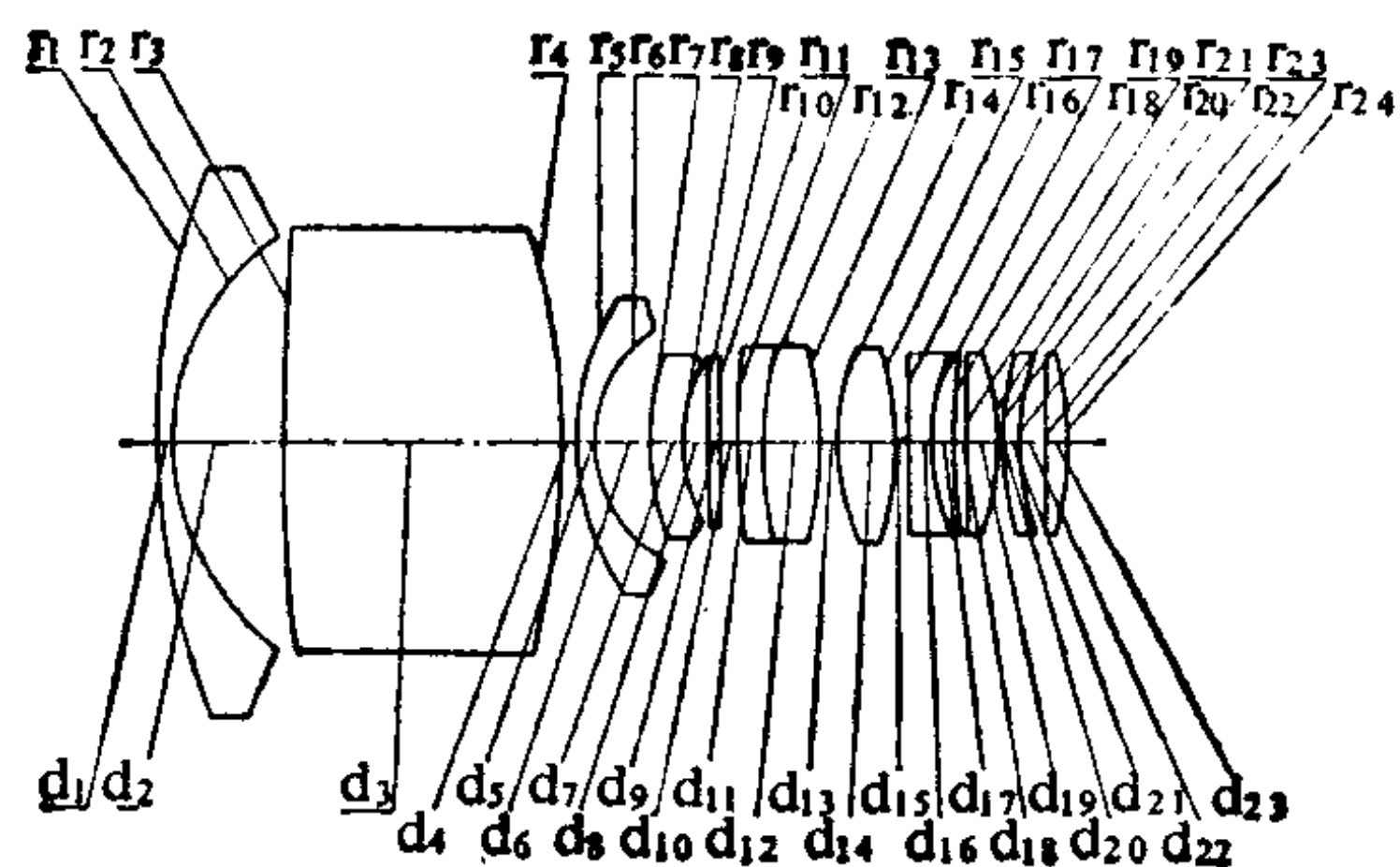
0.2722* = 0.1400 + 0.1322

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1ω)
	-0.001096	-0.000037	0.000244	-0.001650	-0.004297	0.62	-1.4%
h 或 ω %	LA'	ΔH'	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00292	-0.00912	-0.01388	-0.00072	-0.01316	-0.00003	0.00103
70	-0.00602	-0.00442	-0.00677	-0.00805	0.00128	-0.00153	-0.00011



广 角 物 镜

E.F.L=99.8 B.F.L=178.36 FNo.=2.8 F.A.=±47.24°

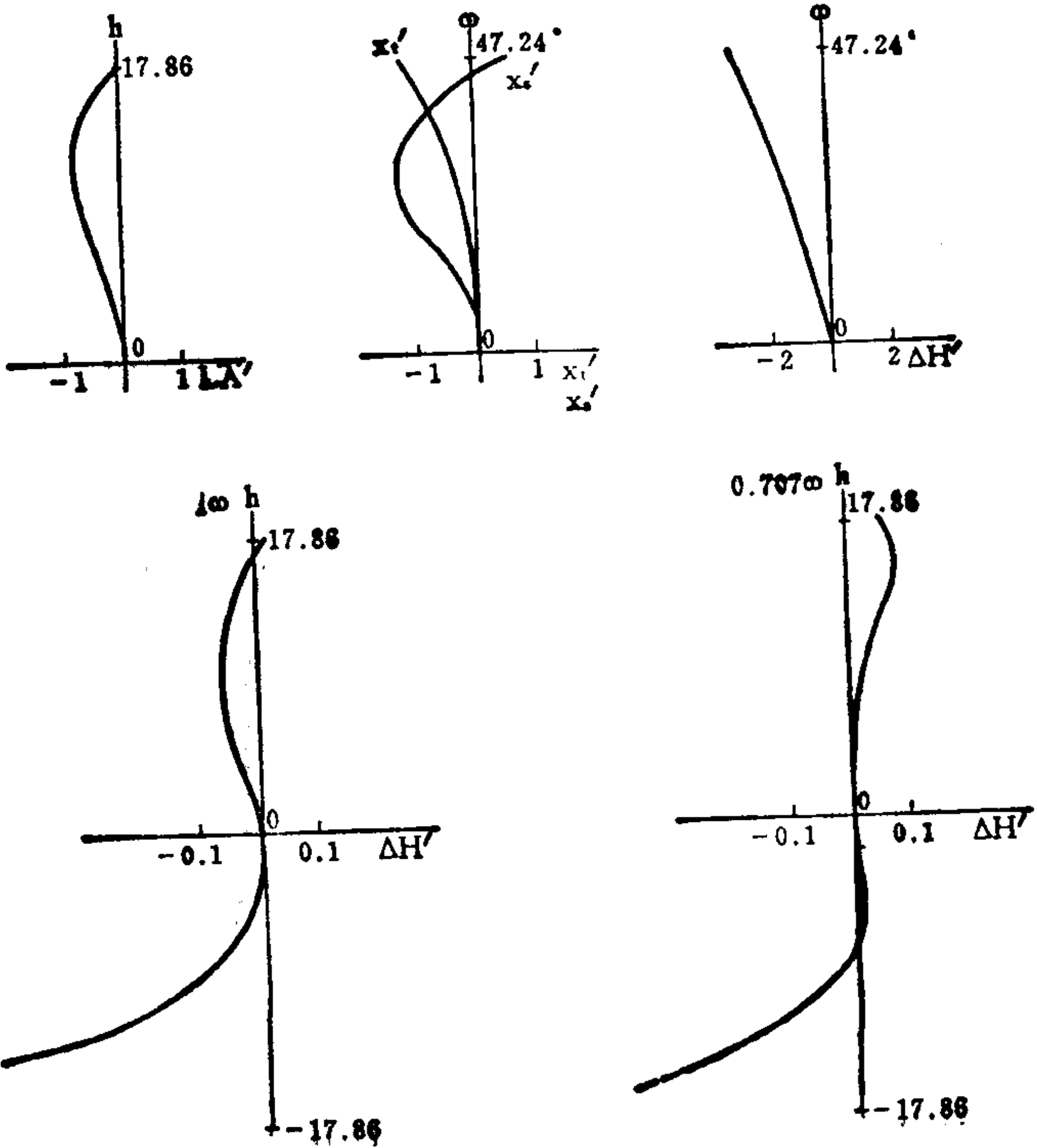


序号	r	d	n	v	序号	r	d	n	v
1	324.0	5.82	1.6400	60.2	13	-189.7	7.76*		
2	126.0	54.94			14	159.7	26.74	1.5892	41.1
3	3321.8	139.21	1.6204	60.3	15	-236.3	5.67		
4	-350.9	0.48			16	∞	11.40	1.8051	25.4
5	119.7	10.19	1.5119	58.1	17	95.5	10.63	1.6393	44.9
6	58.5	28.29			18	202	7.18		
7	189.8	14.56	1.8160	46.8	19	4078.3	15.48	1.6170	62.8
8	86.5	12.13			20	-110.2	0.97		
9	∞	3.88	1.5163	64.1	21	342.2	7.28	1.8051	25.4
10	∞	4.85			22	108.8	14.27		
11	487.4	11.26	1.8074	35.4	23	∞	14.02	1.7865	50.2
12	216.3	28.73	1.7407	27.8	24	-169.6			

7.76* = 3.90 + 3.86

	ΣS ₁	ΣS ₂	ΣS ₃	ΣS ₄	ΣS ₅	HI	QP(1ω)
	-0.1862	0.0160	0.0667	-0.2266	-1.5849	107.9	-3%
h 或 ω %	LA'	ΔH'	x' _t	x' _s	x' _t - x' _s	K' _{T1}	K' _{T0.7}
100	0.0783	-3.298	-1.147	0.606	-1.753	-0.4707	-0.1954
70	-0.7797	-2.093	-0.4926	-1.3195	0.8269	-0.2813	-0.0360

注：镜片 5 是滤色片。



编号: 07-02-029

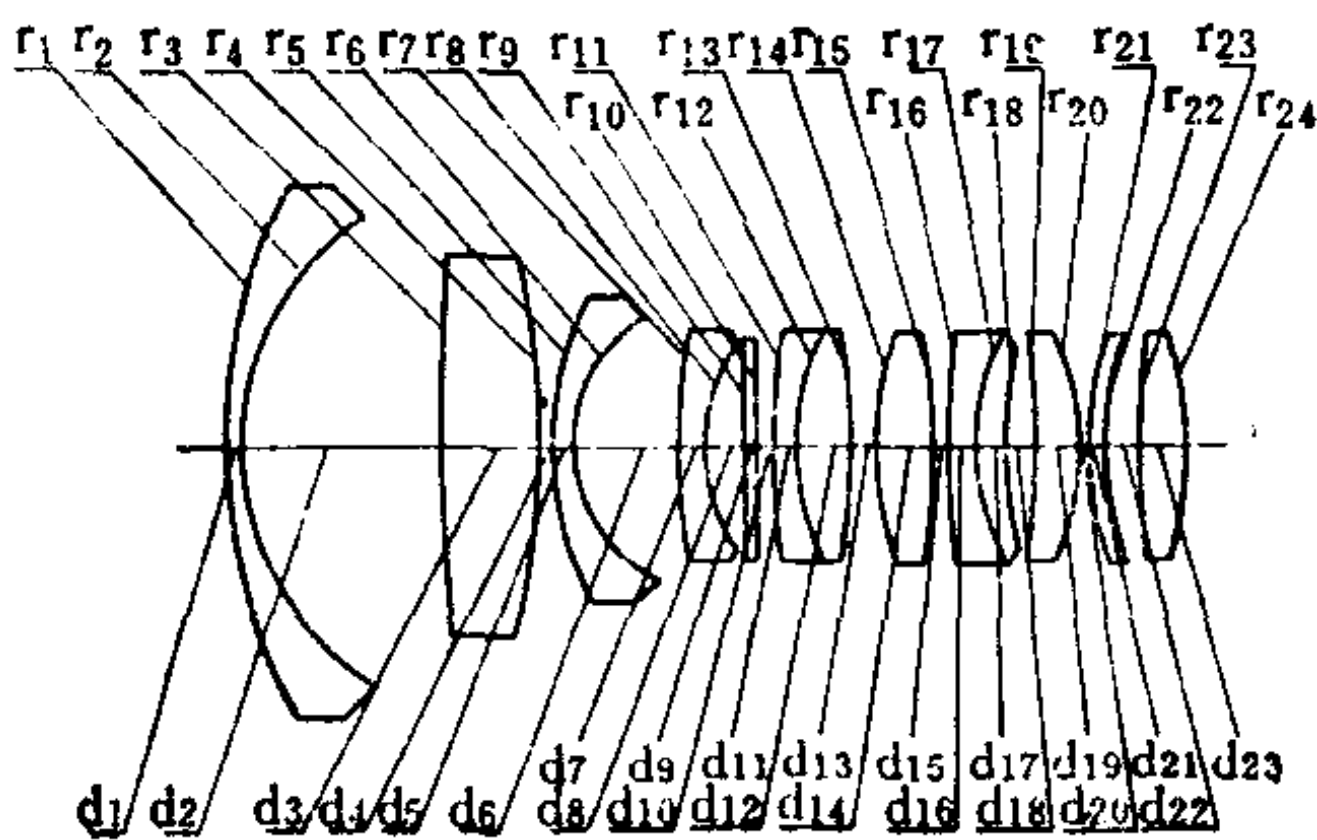
广 角 物 镜

E.F.L=100

B.F.L=183.8

FNo.=2.8

F.A.=±47.3°

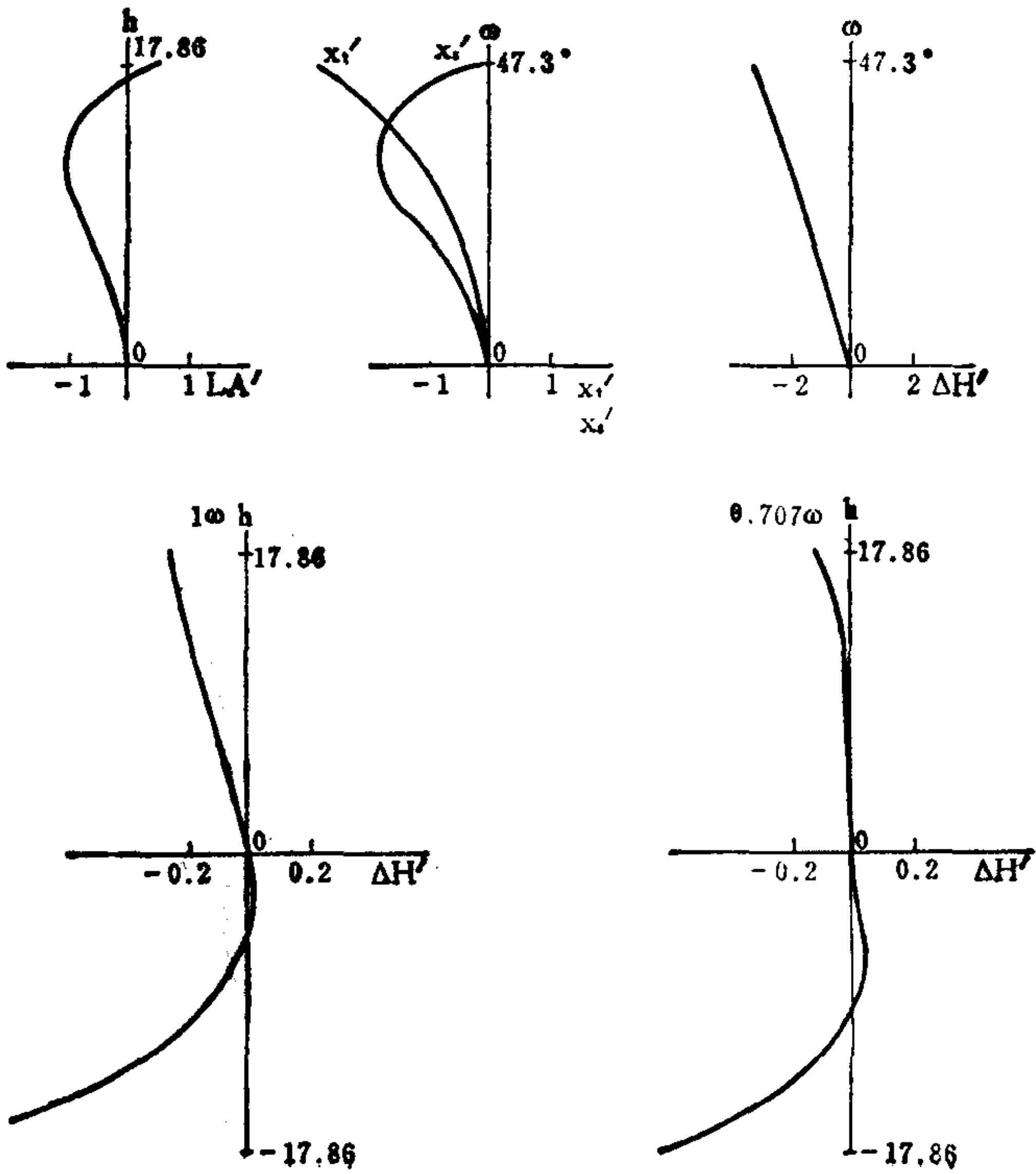


序号	r	d	n	v	序号	r	d	n	v
1	219.2	5.84	1.6968	55.7	13	-165.7	7.30*		
2	110.9	78.58			14	134.7	24.34	1.5892	41.1
3	2434.5	39.00	1.5955	39.2	15	-211.6	1.85		
4	-369.4	0.53			16	35056.8	8.42	1.8051	25.4
5	132.9	8.91	1.6237	46.9	17	77.4	13.13	1.6700	47.3
6	59.3	37.58			18	169.7	9.73		
7	185.1	14.60	1.8061	40.8	19	-3408.3	17.72	1.6134	57.4
8	85.4	12.17			20	-105.6	0.43		
9	∞	3.89	1.5163	64.1	21	299.0	5.89	1.8466	23.9
10	∞	4.86			22	106.5	14.60		
11	420.8	11.44	1.8340	37.2	23	841.8	18.45	1.5891	61.1
12	92.6	20.88	1.7552	27.5	24	-147.5			

$7.30^* = 3.70 + 3.60$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.2606	0.0614	0.0387	-0.2739	-1.6052	108.3	-2.9%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.6354	-3.148	-2.901	-0.100	-2.801	-0.6541	-0.2889
70	-1.0642	-2.159	-1.256	-1.864	0.608	-0.3911	-0.0803

注: 镜片 5 是滤色片。



编号: 07-02-030

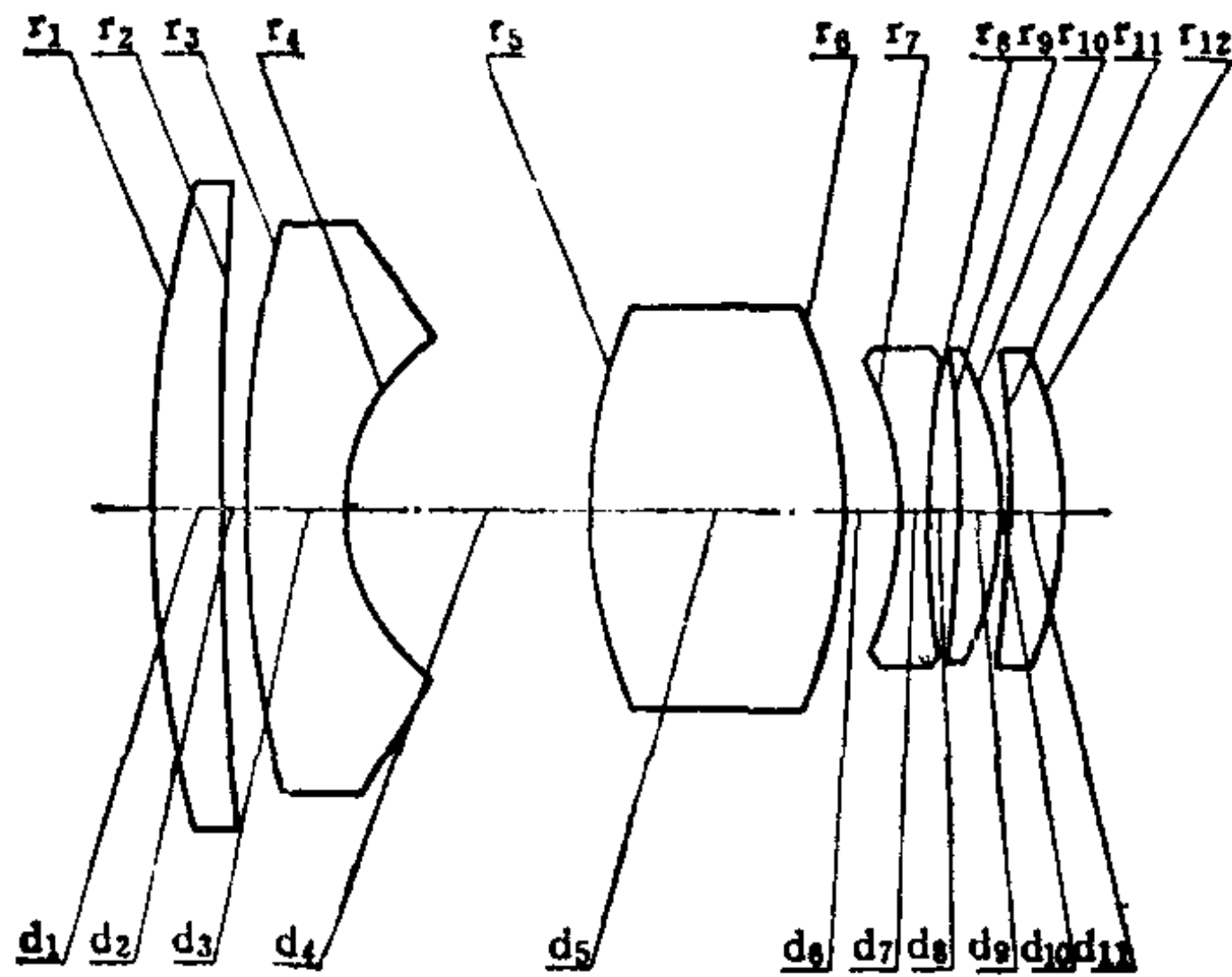
广 角 照 相 物 镜

E.F.L = 100

B.F.L = 130.2

FNo. = 2.8

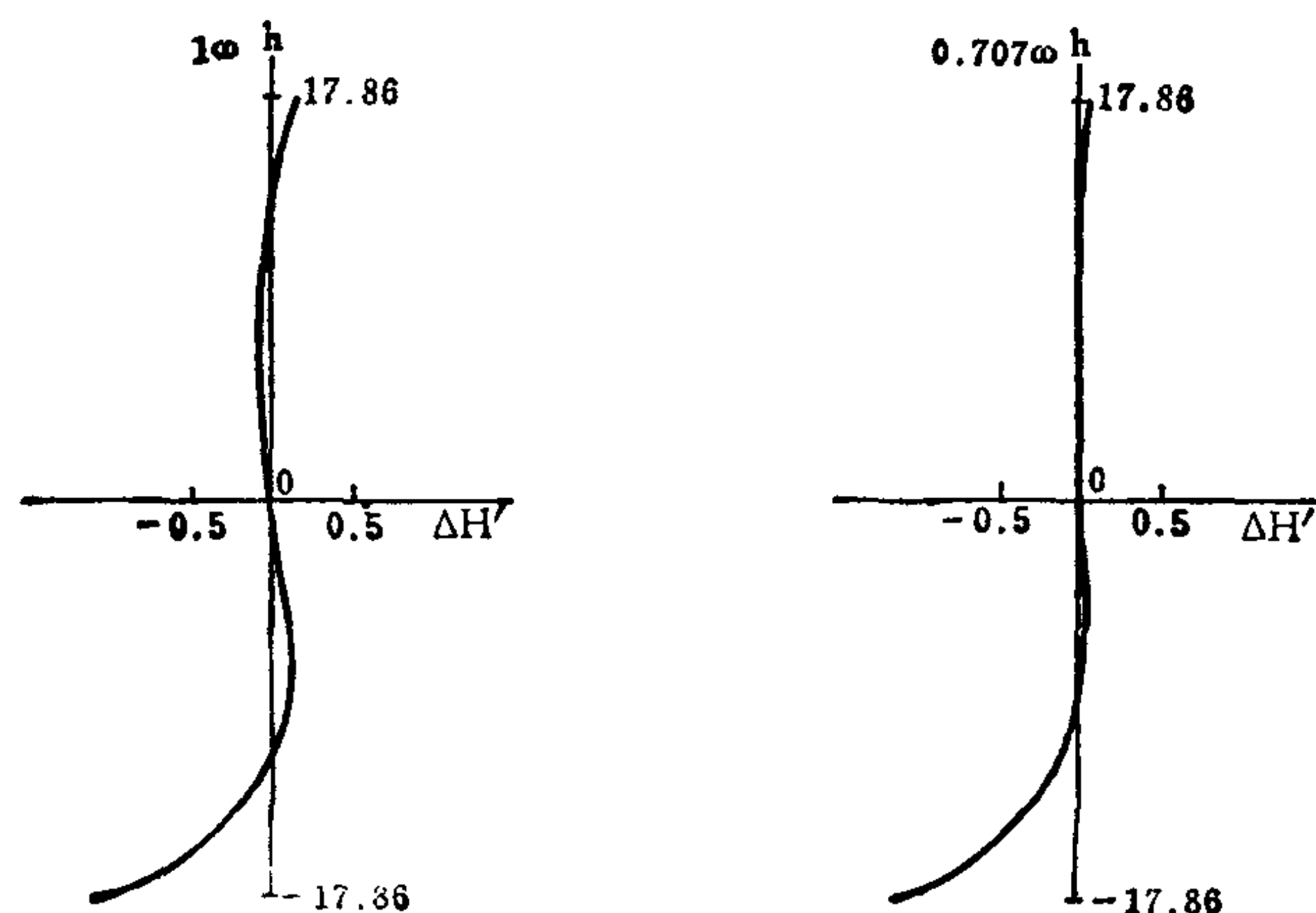
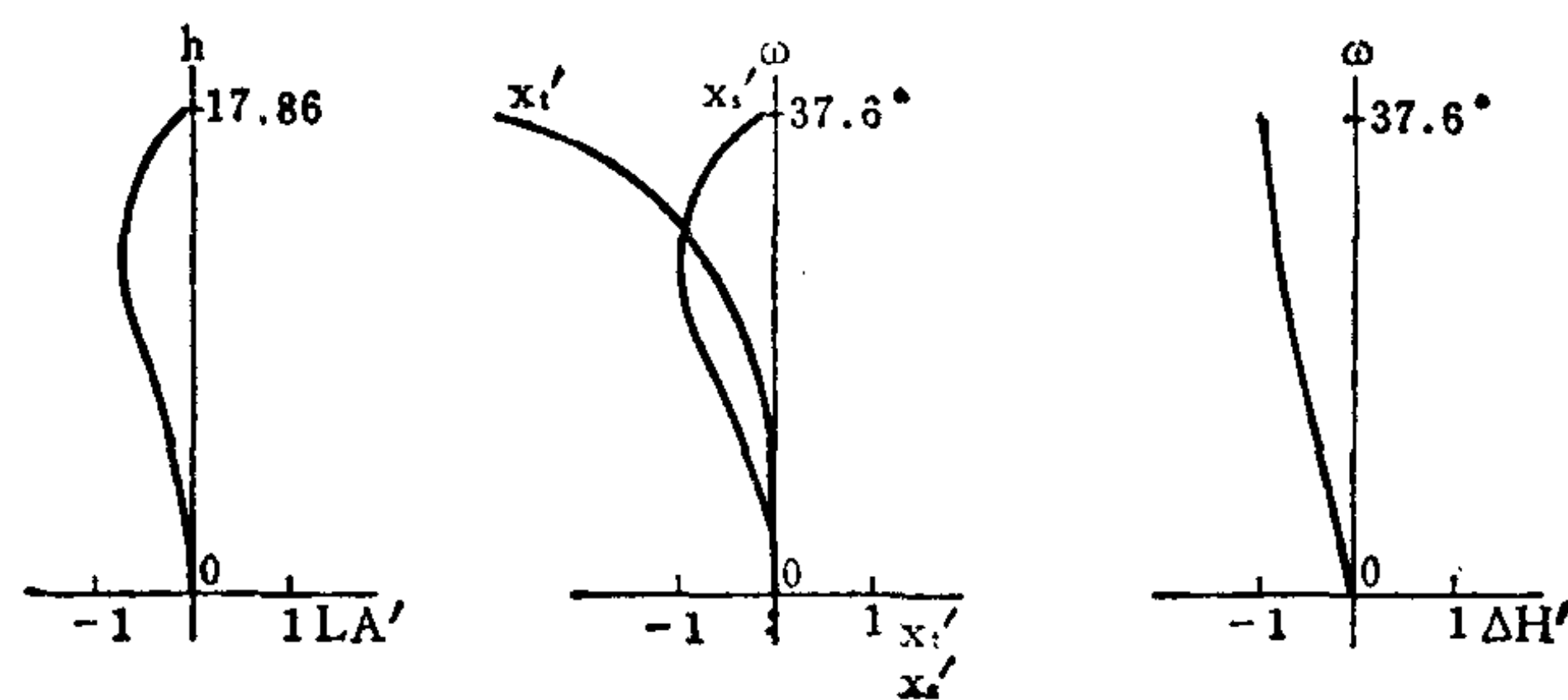
F.A. = $\pm 37.6^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	268.630	12.54	1.62280	57.0	7	-62.000	4.23	1.74077	27.8
2	1489.437	0.35			8	137.345	4.86		
3	179.577	19.23	1.62041	60.3	9	-237.782	8.06	1.62281	57.0
4	38.908	45.42			10	-64.877	0.35		
5	94.880	44.26	1.72000	43.7	11	-1802.817	8.52	1.62041	60.3
6	-85.317	10.56*			12	-81.169			

$$10.56^* = 5.00 + 5.56$$

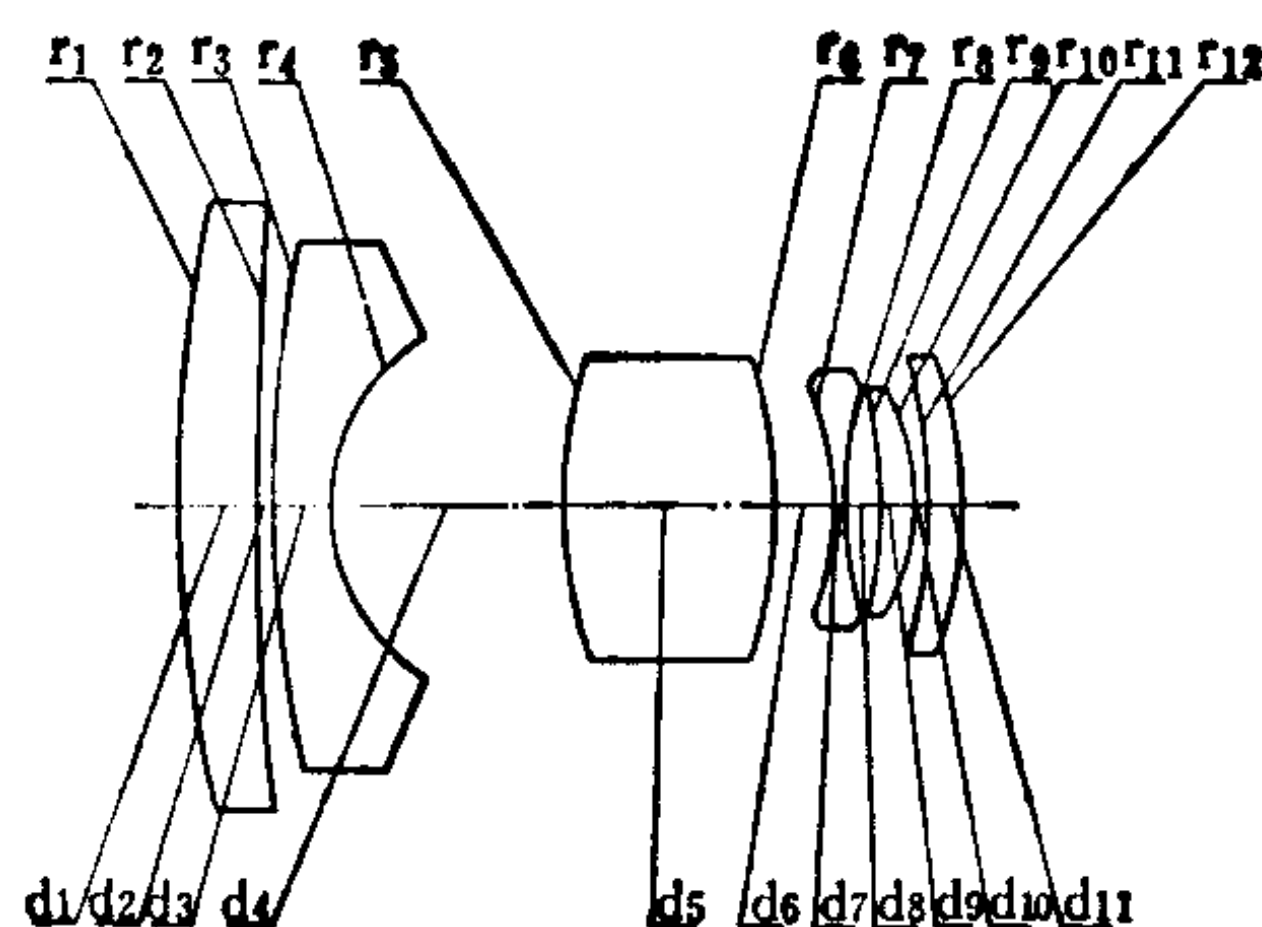
	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.1373	0.0633	0.0106	-0.1929	-0.7027	77	-1.17%
h 或 ω %	LA'	$\Delta H'$	x_t'	x_s'	$x_t' - x_s'$	K'_{t1}	$K'_{t0.7}$
100	-0.049	-0.903	-2.894	-0.121	-2.773	-0.4622	-0.0484
70	-0.657	-0.752	-0.667	-1.014	0.347	-0.5135	-0.0841



编号: 07-02-031

广 角 照 相 物 镜

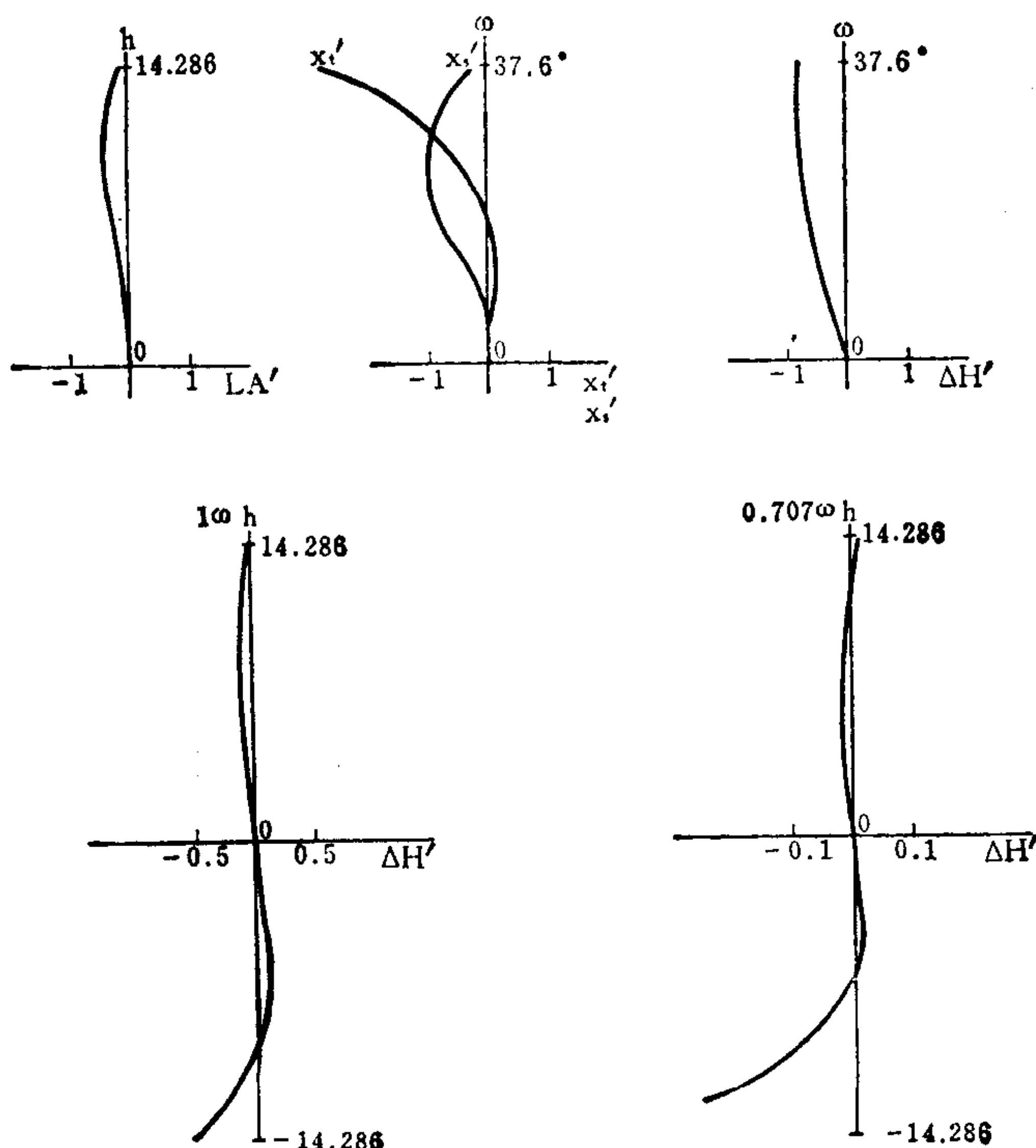
E.F.L=100 B.F.L=130.1 FNo.=3.5 F.A.=±37.6°



序号	r	d	n	v	序号	r	d	n	v
1	271.127	16.59	1.62280	57.0	7	-63.380	3.98	1.74077	27.8
2	3970.472	0.35			8	127.465	3.78		
3	213.933	13.45	1.62041	60.3	9	-256.651	7.22	1.62280	57.0
4	39.169	45.74			10	-57.049	0.35		
5	83.475	41.13	1.72000	43.7	11	-2112.676	7.36	1.62041	60.3
6	-100.352	10.56*			12	-93.014			

10.56* = 5.00 + 5.56

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.0448	0.0281	0.0125	-0.1241	-0.5705	76.99	-1%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.079	-0.780	-2.923	-0.300	-2.623	-0.3057	-0.0776
70	-0.335	-0.746	-0.543	-1.034	0.491	-0.2745	-0.0553



编号: 07-02-032

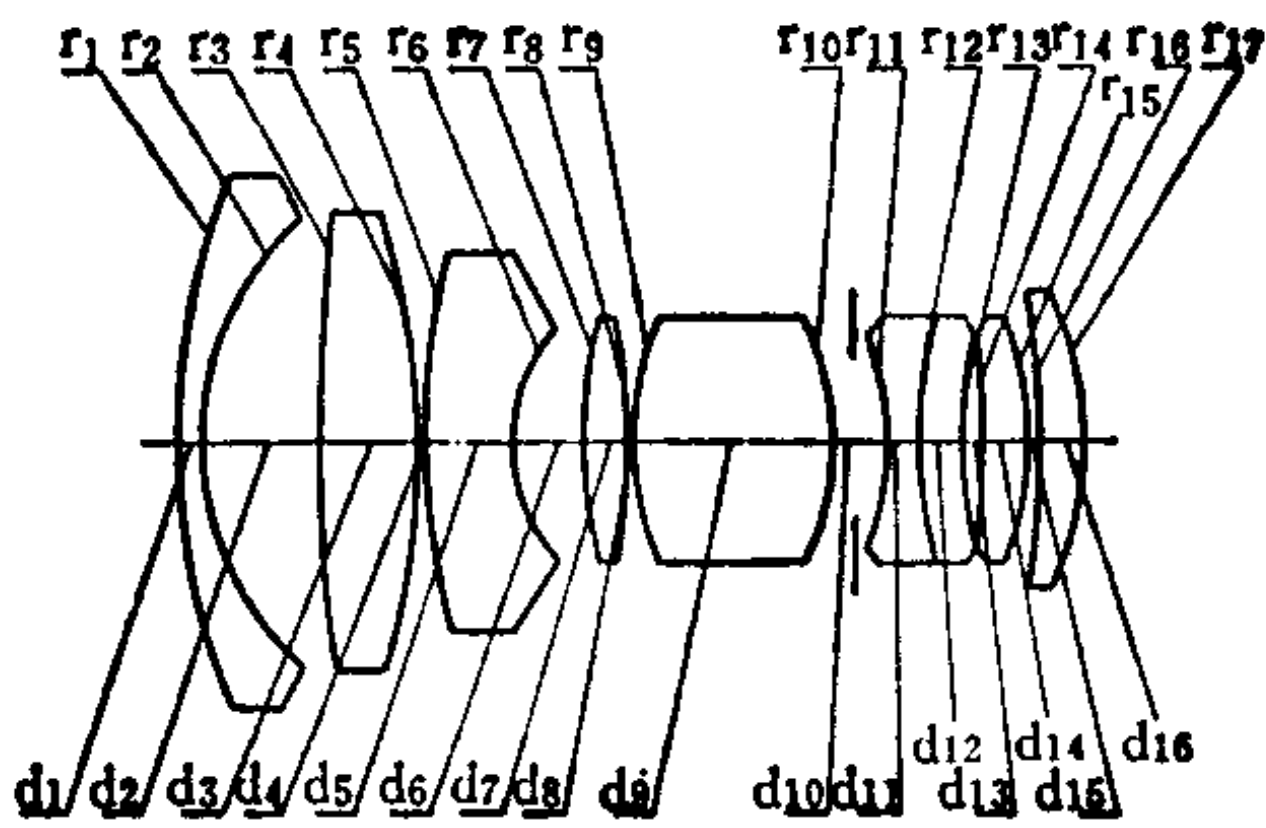
反远距型超广角照相物镜

E.F.L = 1

B.F.L = 1.488

FNo. = 2.8

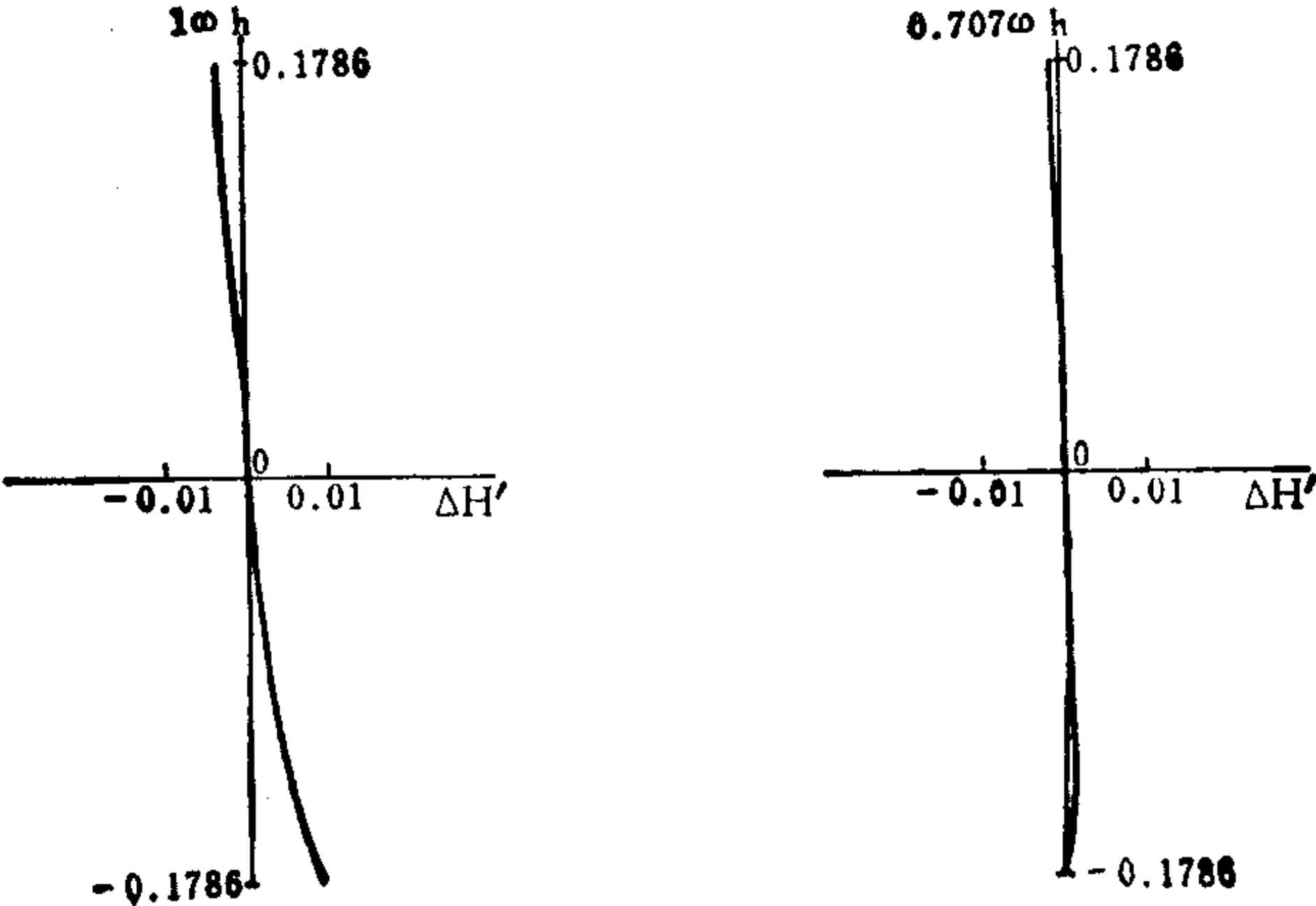
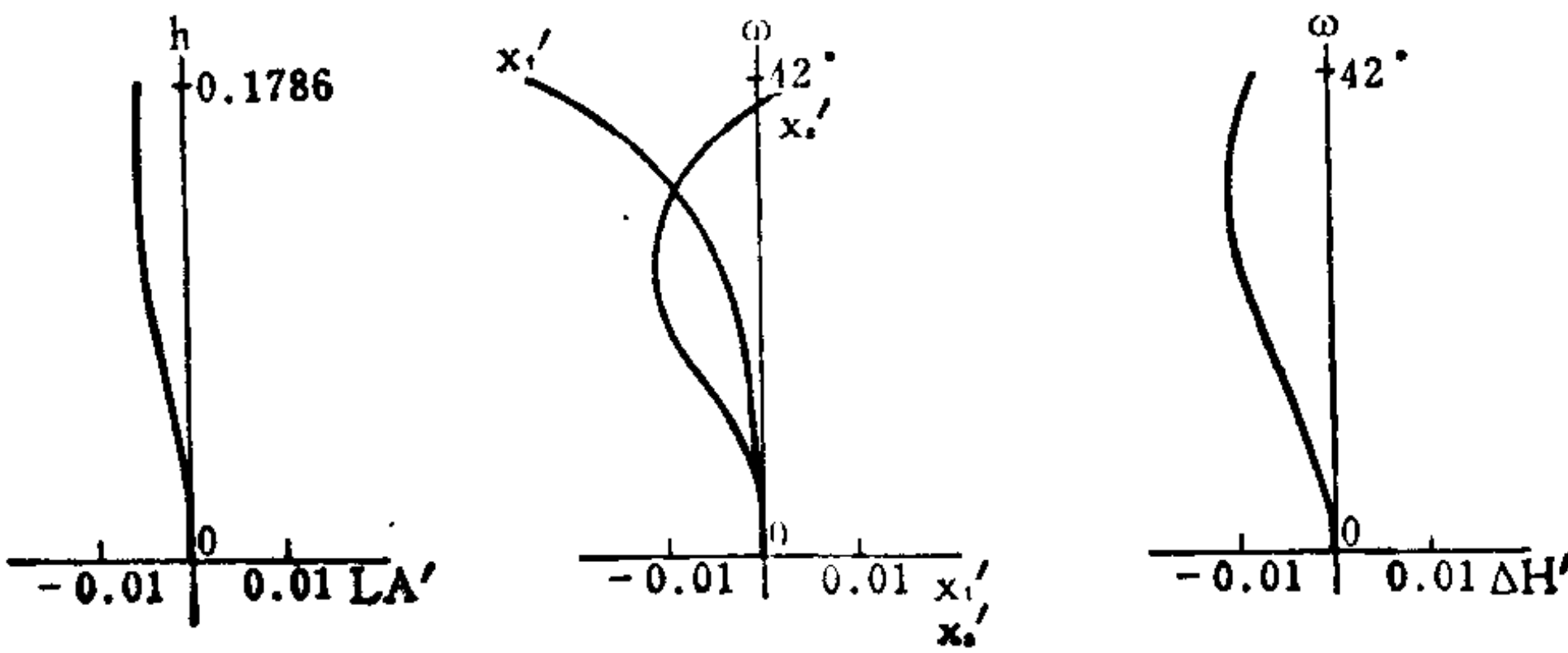
F.A. = $\pm 42^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	1.7432	0.0815	1.58913	61.0	10	-0.7111	0.1223*		
2	0.7914	0.3087			11	-0.8777	0.0979	1.80518	25.4
3	17.9249	0.2489	1.58913	61.0	12	2.4012	0.1019	1.72342	37.9
4	-2.8661	0.0408			13	1.5432	0.0489		
5	7.4418	0.2201	1.57957	53.7	14	-4.0265	0.1060	1.71300	53.9
6	0.4674	0.1857			15	-0.8657	0.0061		
7	1.8410	0.1142	1.80518	25.4	16	-4.2395	0.1101	1.71300	53.9
8	-9.2564	0.0041			17	-1.0165			
9	1.3639	0.5027	1.58913	61.0					

$0.1223^* = 0.0600 + 0.0623$

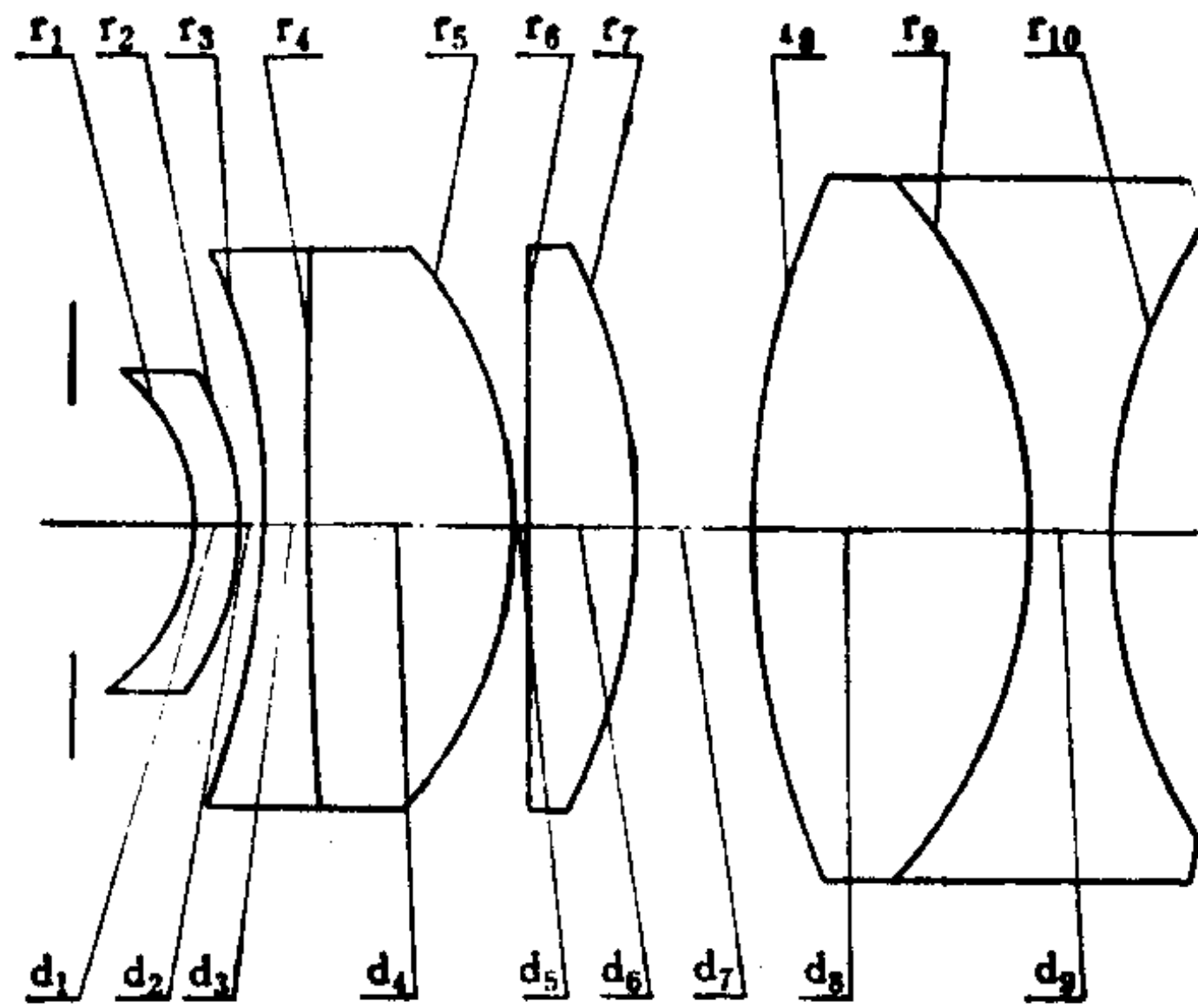
	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.001070	0.000038	0.000464	-0.001995	-0.009588	0.9	-0.88%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00439	-0.00794	-0.02580	0.00616	-0.03196	0.003034	0.000705
70	-0.00500	-0.01055	-0.00656	-0.01094	0.00438	-0.000877	-0.000045



编号: 07-02-033

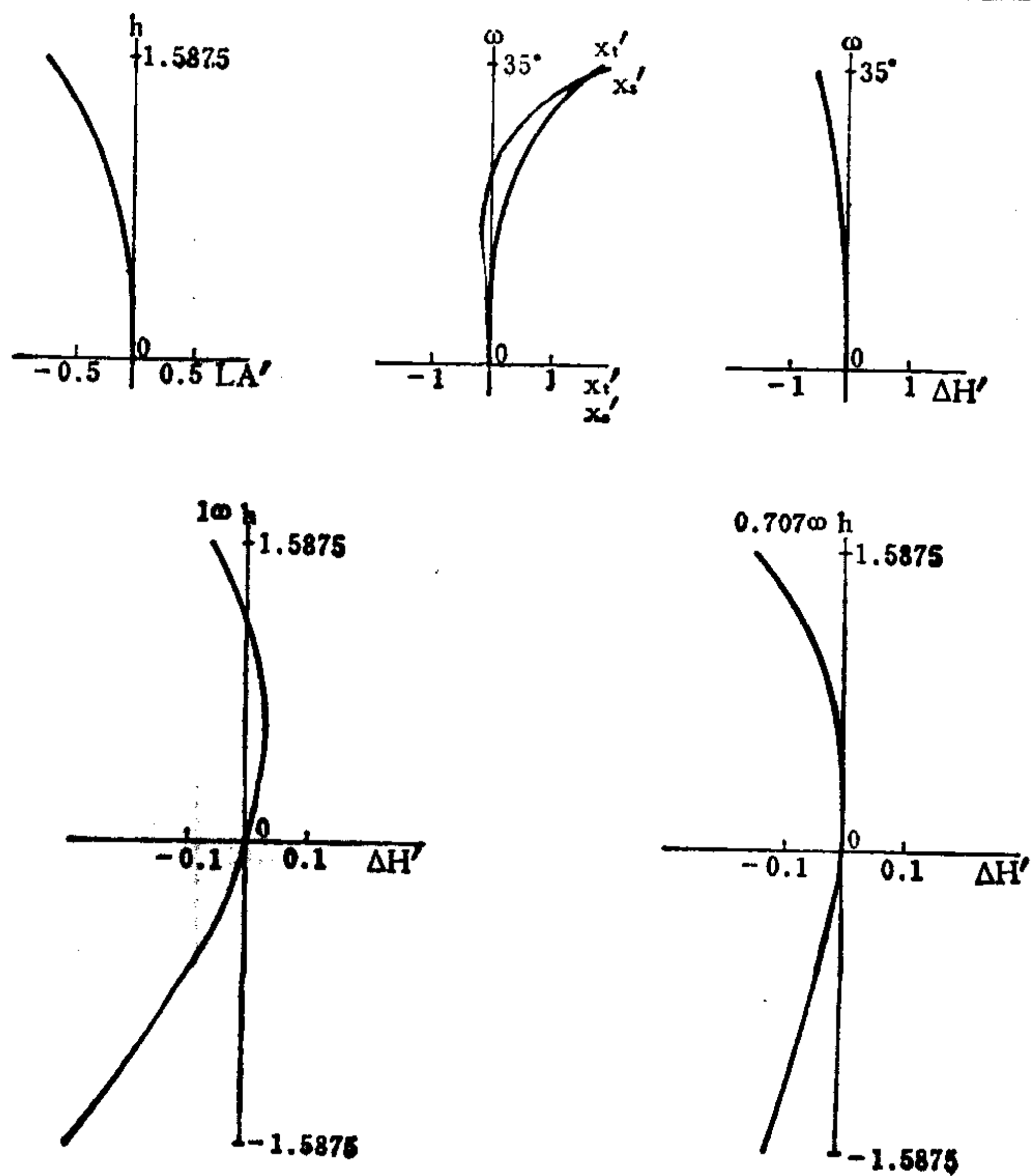
广 角 物 镜

E.F.L=12.7 B.F.L=6.8 FNo.=4 F.A.= $\pm 35^\circ$ ** $L'_{p1}=-2$



序号	r	d	n	v	序号	r	d	n	v
1	-4.10	1.0	1.73		6	∞	2.2	1.49	
2	-4.82	0.2			7	-12.88	2.2		
3	-15.38	1.0	1.73		8	15.30	6.0	1.62	
4	∞	4.2	1.62		9	-10.25	1.5	1.73	
5	-8.71	0.2			10	11.02			

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.02169	-0.01491	0.01098	-0.00792	-0.15192	8.8	-6.2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.694	-0.552	1.814	0.197	1.617	-0.1778	-0.0859
70	-0.346	-0.251	0.460	0.079	0.381	-0.1295	-0.0633



编号: 07-02-034

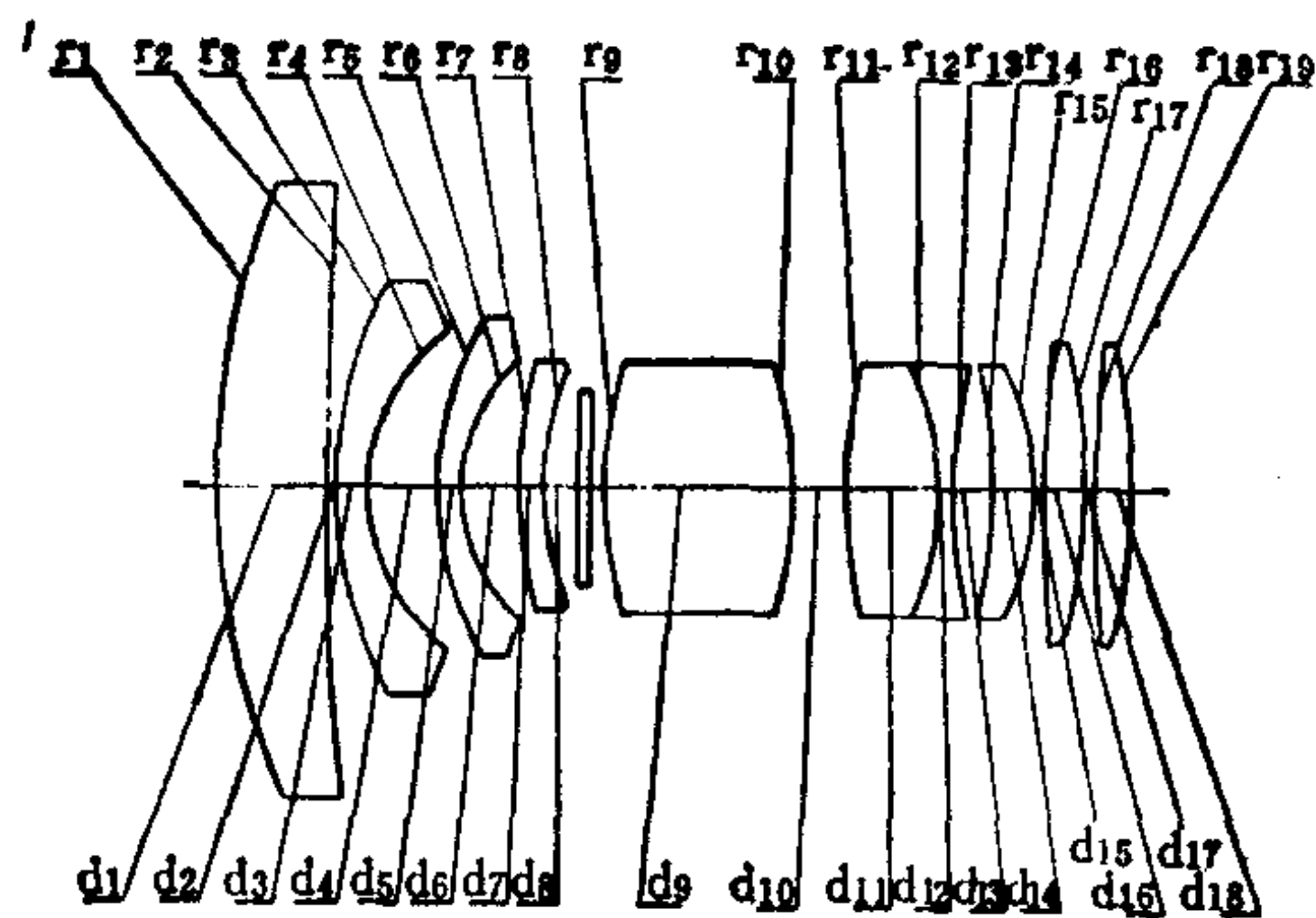
超广角 大孔径物镜

E.F.L = 104.1

B.F.L = 199.6

FNo. = 2.08

F.A. = $\pm 47.1^\circ$



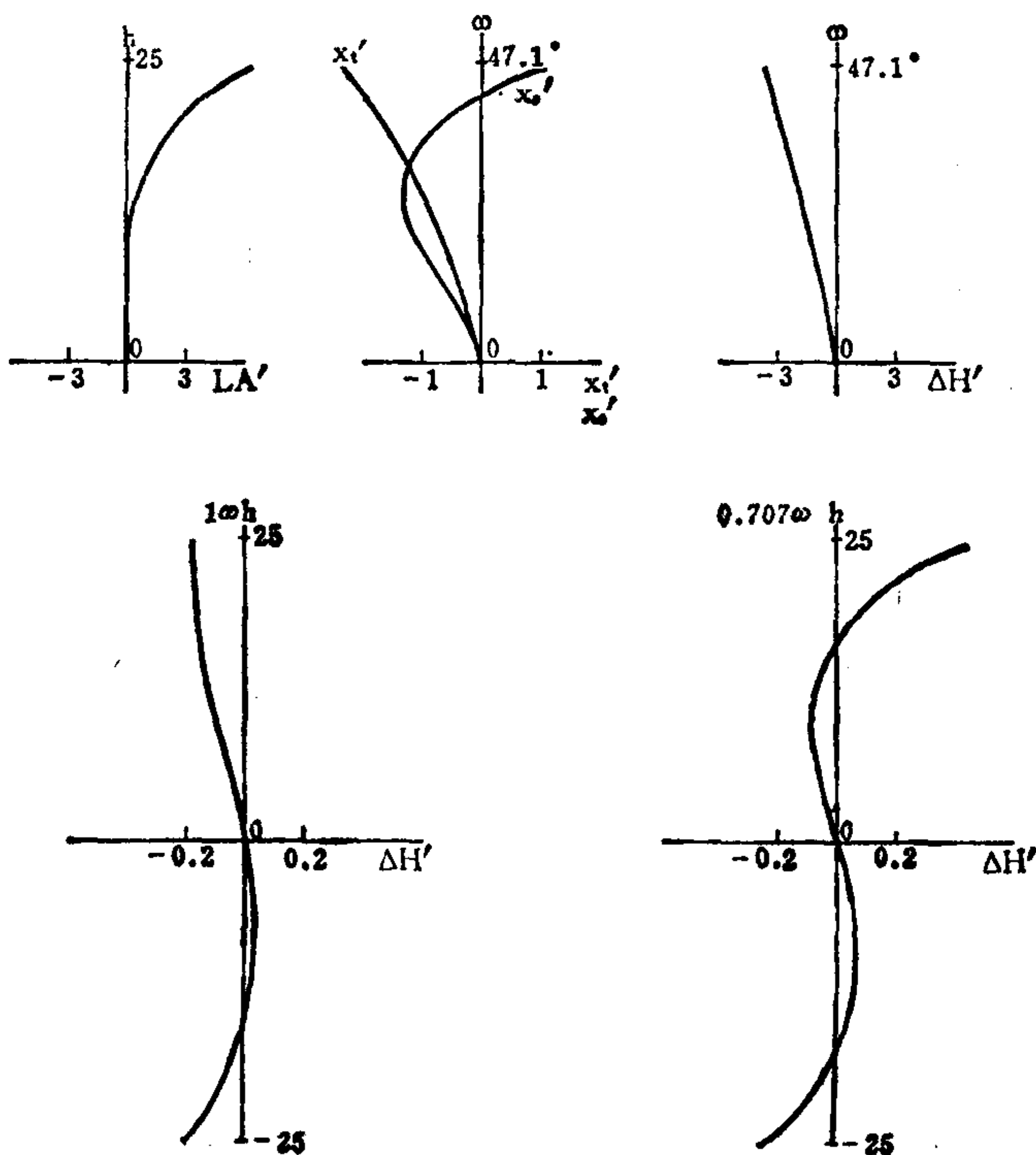
序号	r	d	n	v	序号	r	d	n	v
1	339.720	49.41	1.64000	60.2	10	-272.635	28.77*		
2	952.881	0.49			11	857.551	33.97	1.64000	60.2
3	218.581	9.95	1.74320	49.4	12	-126.036	4.85	1.84666	23.9
4	93.059	32.61			13	276.629	14.56		
5	162.580	8.74	1.51821	65.0	14	-766.797	17.62	1.51821	65.0
6	76.282	24.31			15	-124.736	0.49		
7	213.538	8.74	1.74320	49.4	16	5992.735	17.96	1.74320	49.4
8	97.733	26.69			17	-233.291	0.49		
	∞			滤色片	18	5117.276	13.54	1.69680	55.5
	∞				19	-384.364			
9	202.478	81.34	1.78470	26.2					

$$28.77^\circ = 14.40 + 14.37$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	0.0715	-0.0488	0.0191	-0.2503	-2.3244	112	-3.2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	6.206	-3.641	-2.369	1.321	-3.690	-0.1887	-0.1018
70	1.384	-2.589	-1.433	-1.097	-0.336	0.0977	0.0011

注: 1. 以上象差值计算时, 未考虑滤色片。

2. 滤色片的基底玻璃是K9, $d = 7.28$ 。



编号: 07-02-035

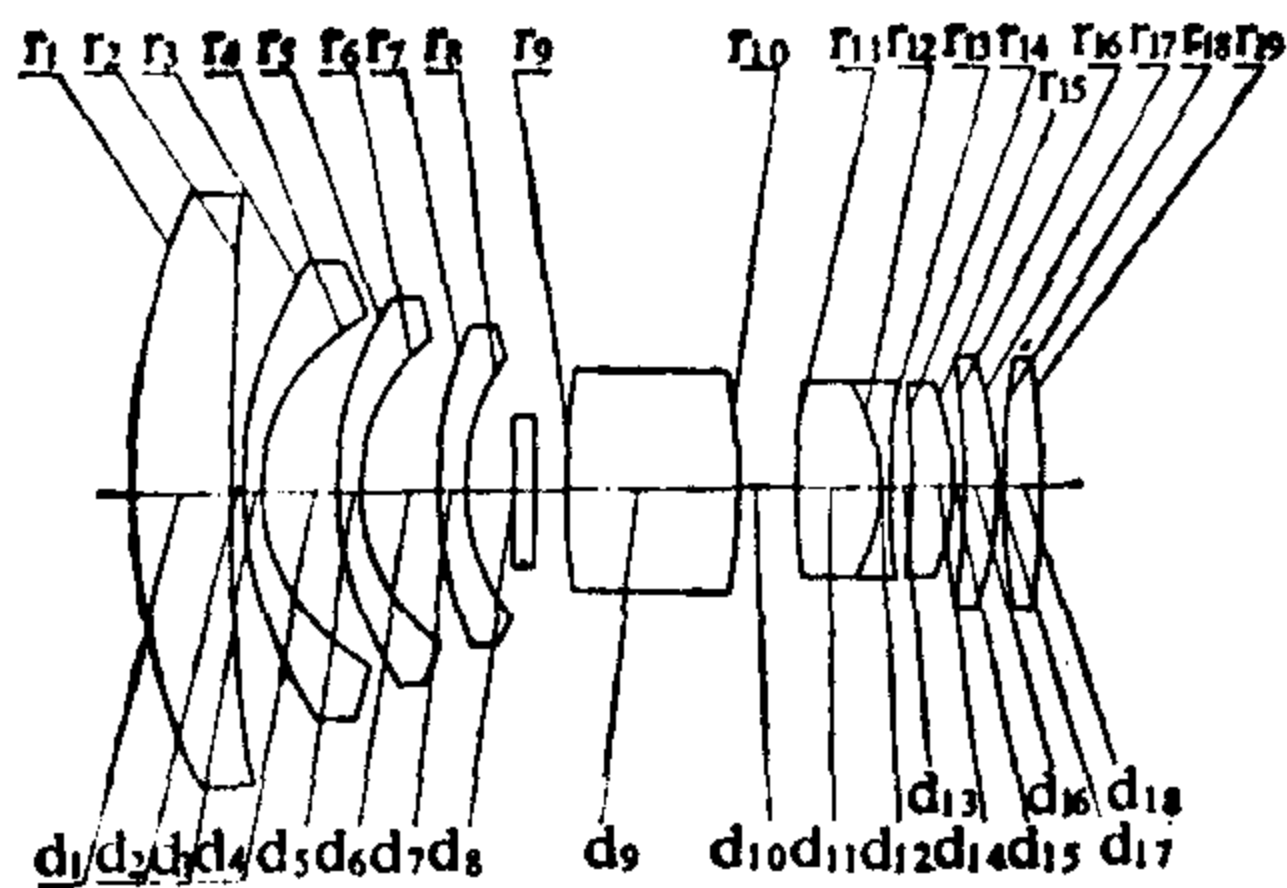
超广角大孔径物镜

E.F.L=104.4

B.F.L=206.2

FNo.=2.09

F.A.=±47.1°

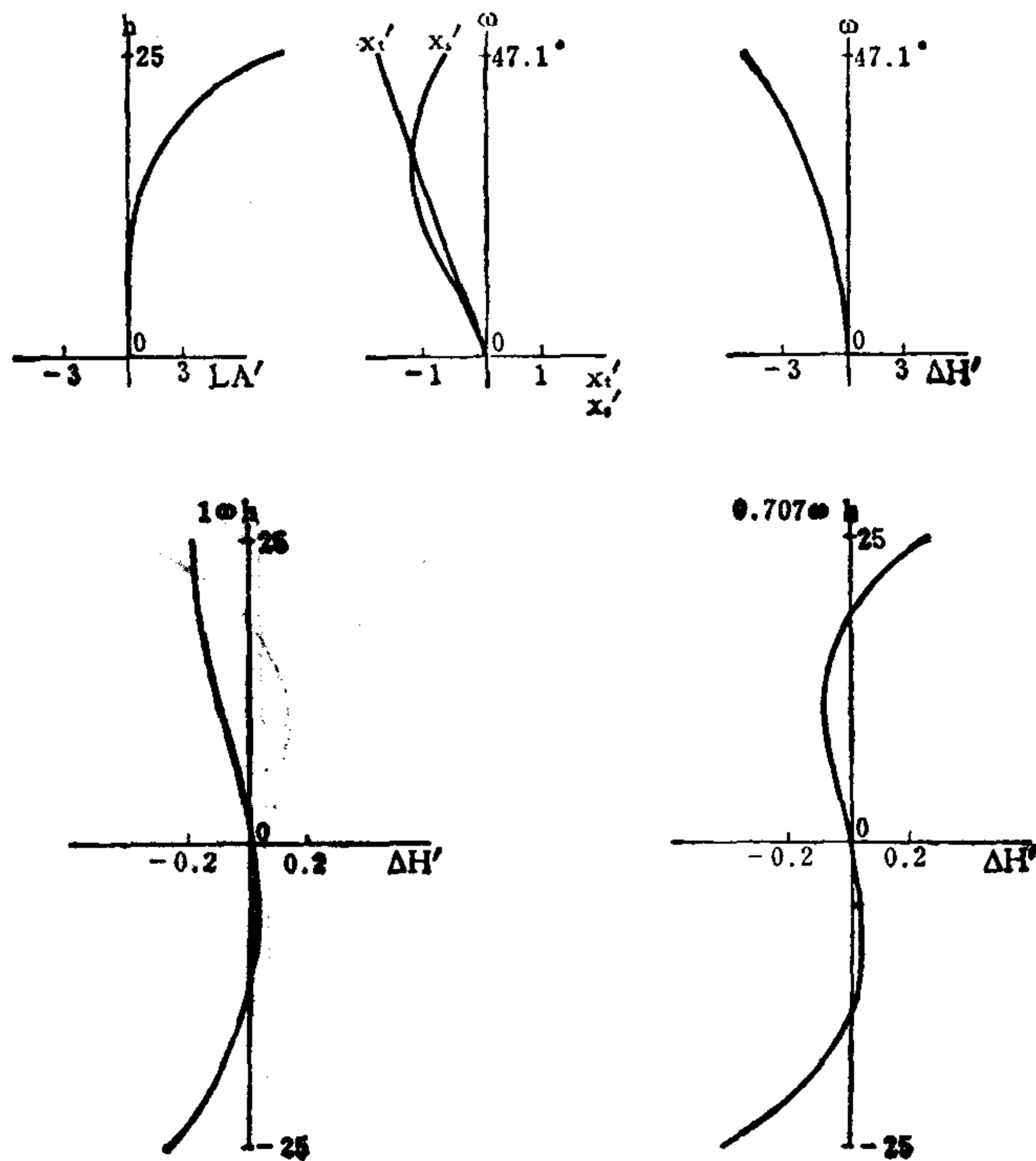


序号	r	d	n	v	序号	r	d	n	v
1	365.854	46.49	1.48749	70.1	10	-253.545	25.24*		
2	1140.959	1.08			11	578.573	39.79	1.64000	60.2
3	174.465	9.73	1.83400	37.2	12	-108.865	6.49	1.84666	23.9
4	94.271	36.93			13	252.722	10.96		
5	186.957	8.65	1.61800	63.4	14	-479.719	18.71	1.48749	70.1
6	91.877	36.07			15	-123.940	0.54		
7	236.259	8.65	1.61800	63.4	16	-4178.124	15.78	1.57135	52.9
8	91.949	45.74			17	-206.188	1.08		
9	∞			滤色片	18	540.043	16.44	1.53172	48.9
8	∞				19	-468.648			
9	219.886	82.50	1.80518	25.4					

$$25.24^{\circ} = 13.00 + 12.24$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	0.0877	-0.0513	0.0225	-0.2622	-2.1657	112.4	-4.5%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	8.099	-5.071	-1.812	-0.785	-1.027	-0.2311	-0.1148
70	1.735	-2.508	-1.342	-1.246	-0.096	-0.0763	-0.0366

- 注: 1. 以上象差值计算时, 未考虑滤色片。
2. 滤色片的基底玻璃是K9, $d = 8.11$ 。



编号: 07-02-036

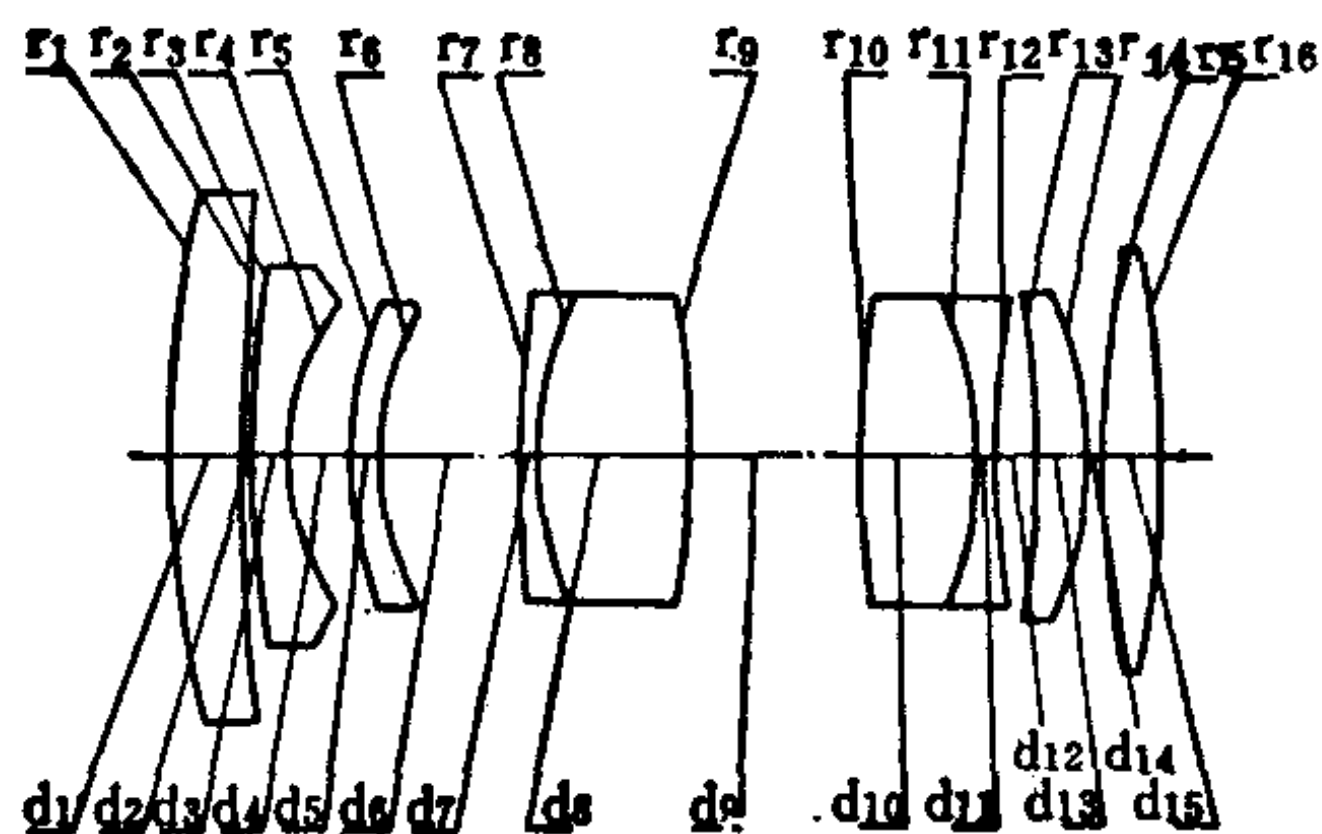
反远距型广角大孔径物镜

E.F.L=100

B.F.L=134.7

FNo.=2

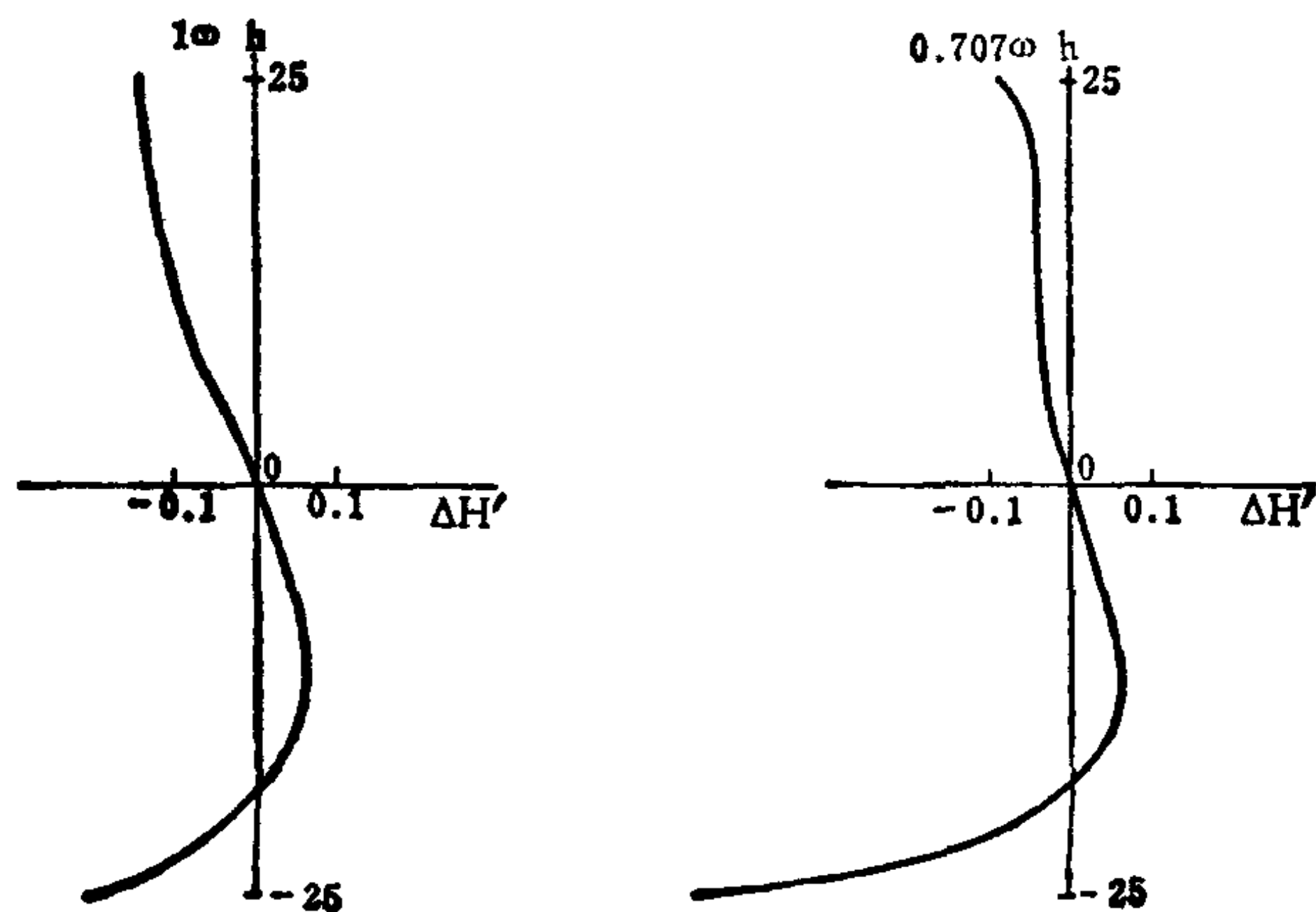
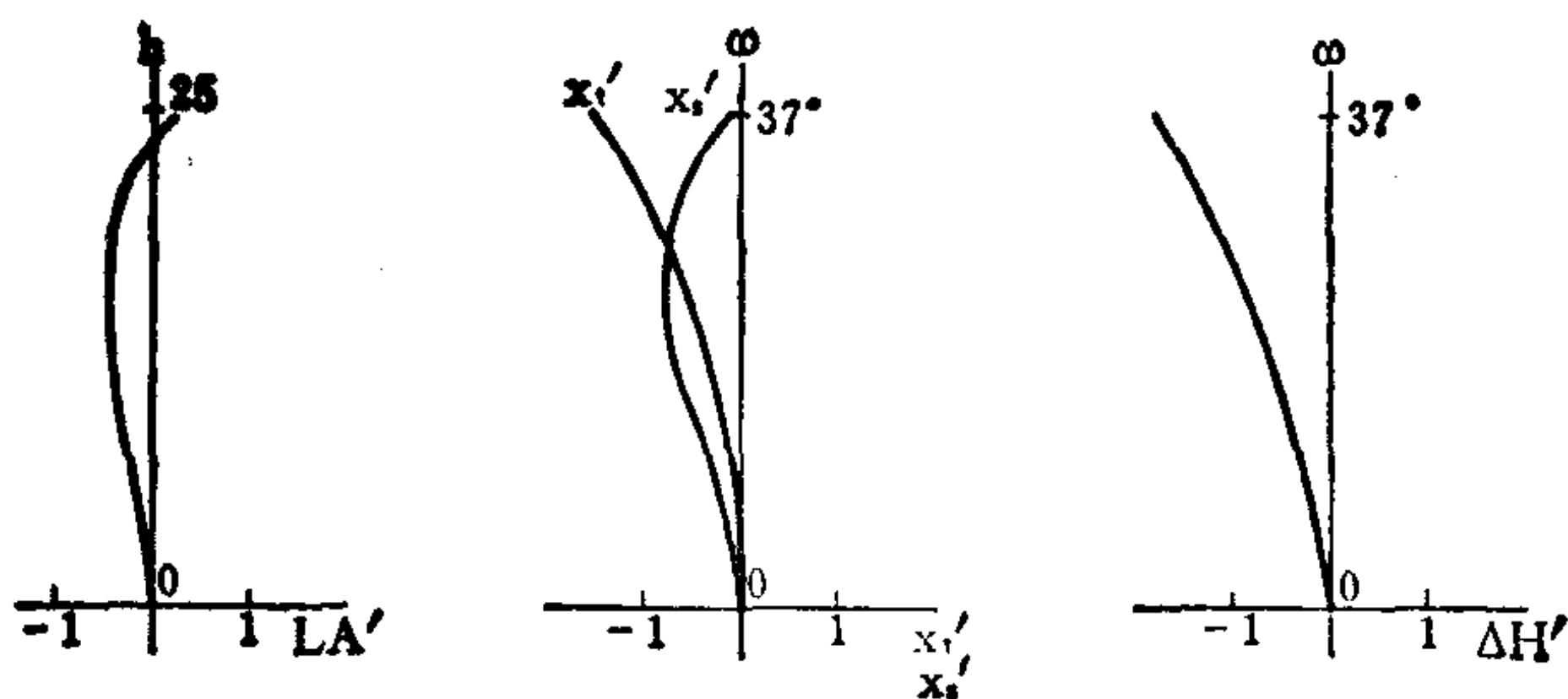
F.A.=±37°



序号	r	d	n	v	序号	r	d	n	v
1	146.803	15.86	1.64000	60.3	9	-6140.173	17.07*		
2	637.795	0.53			10	897.850	21.51	1.79952	42.3
3	193.755	5.20	1.50378	66.8	11	-72.551	3.64	1.76182	26.6
4	44.149	13.02			12	177.680	6.73		
5	81.596	7.11	1.50378	66.8	13	-159.677	10.47	1.69680	55.6
6	54.975	27.48			14	-71.340	0.53		
7	306.164	3.51	1.50378	66.8	15	238.752	10.71	1.69680	55.6
8	67.153	31.31	1.72000	43.7	16	-267.319			

$$17.07^* = 8.50 + 8.57$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.2506	0.1163	-0.0066	-0.2880	-1.1858	75.3	-2.4%
h 或 ω %	LA'	$\Delta H'$	x'_i	x'_s	$x'_i - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.283	-1.818	-1.500	-0.063	-1.437	-0.1762	-0.0521
70	-0.493	-0.982	-0.654	-0.822	0.168	-0.2769	-0.0142



编号: 07-02-037

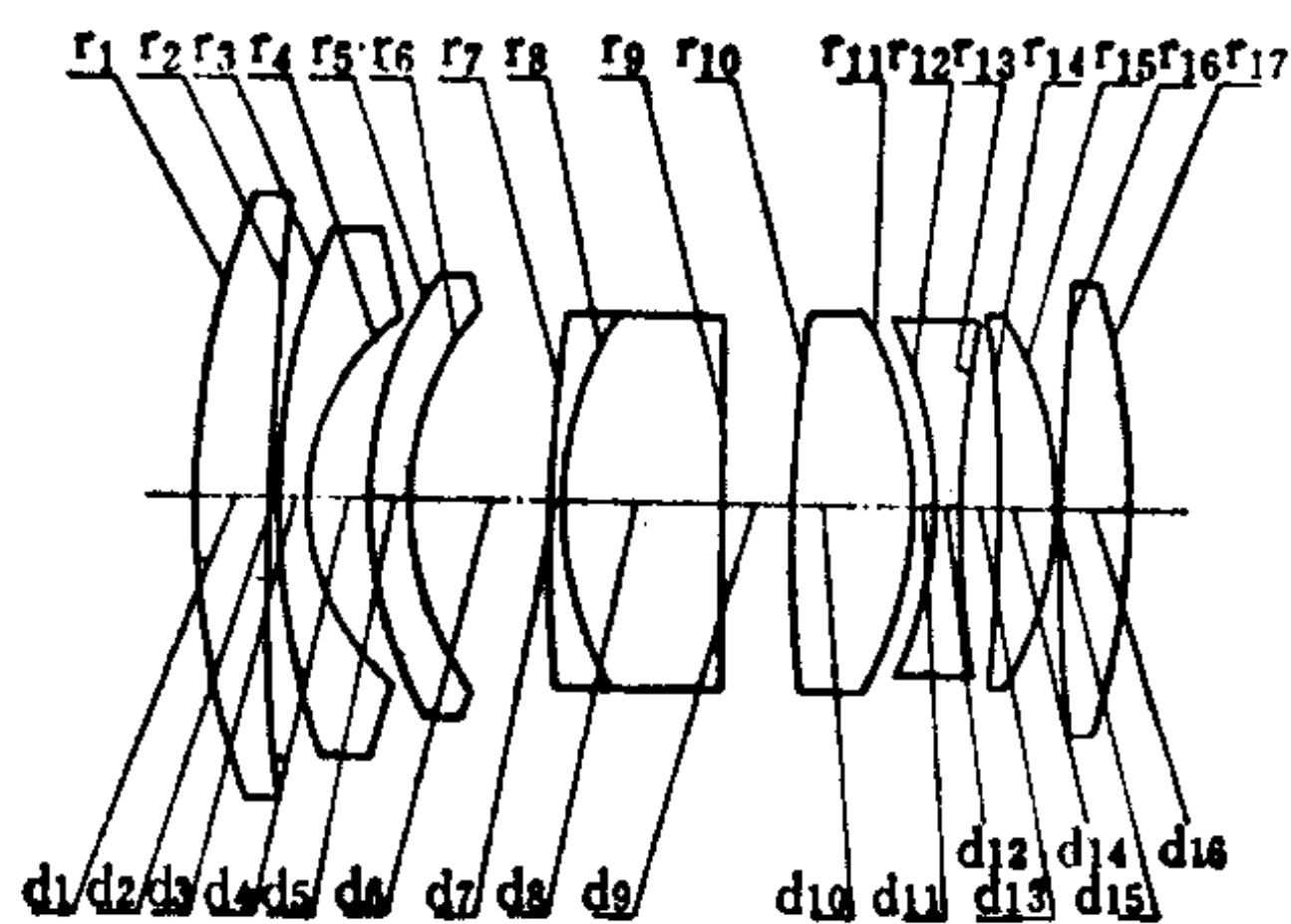
反远距型广角大孔径物镜

E.F.L = 100

B.F.L = 134.5

FNo. = 2

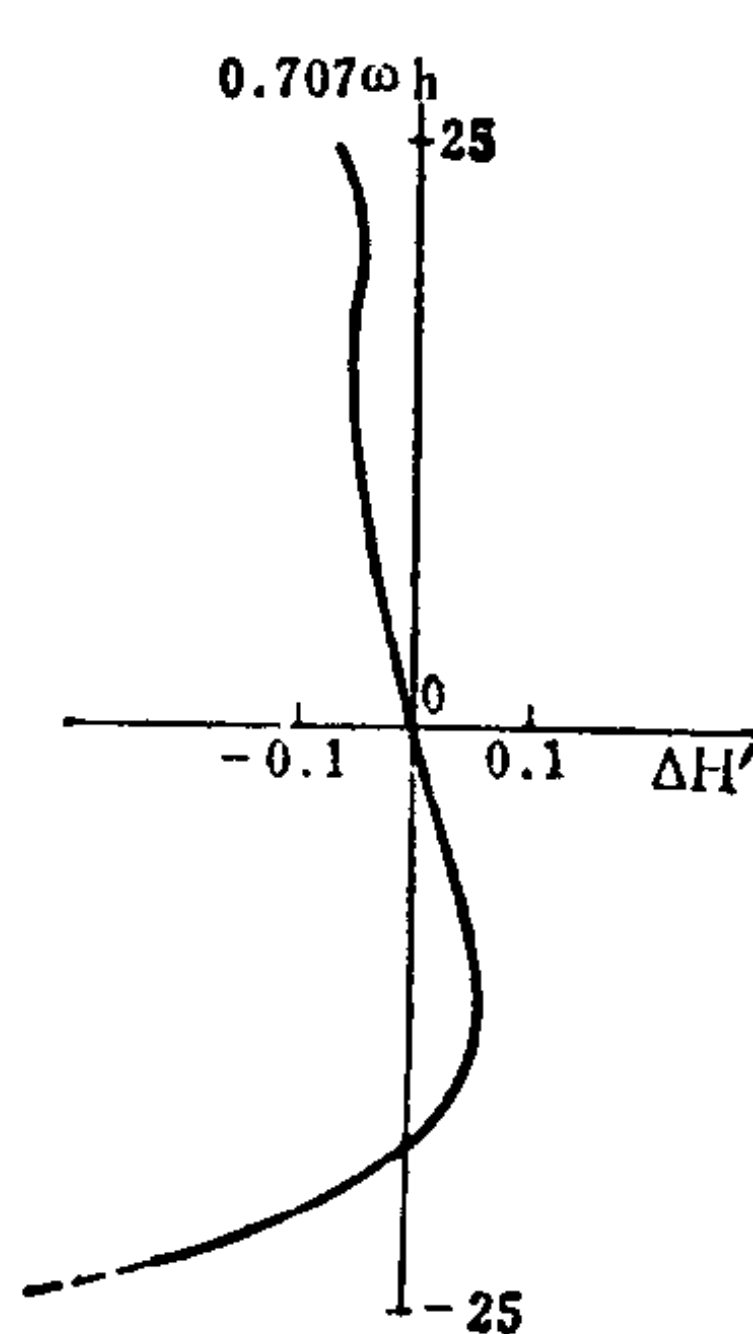
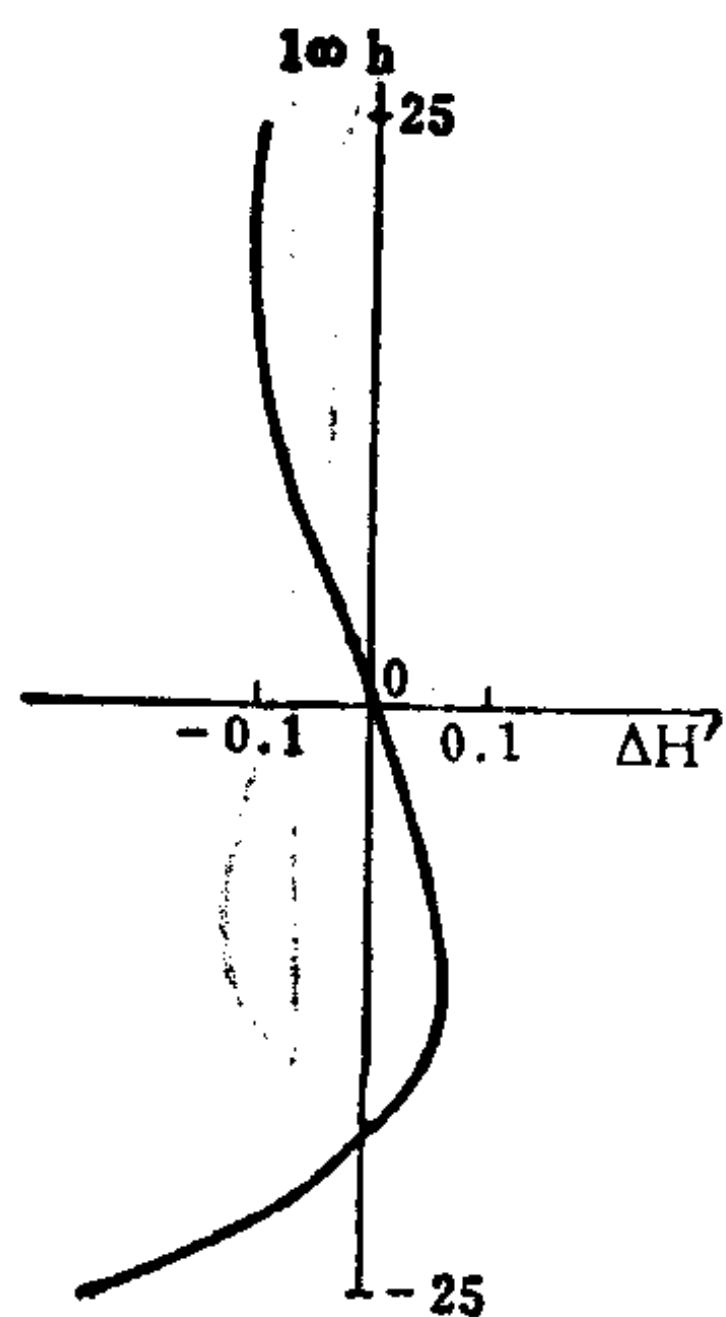
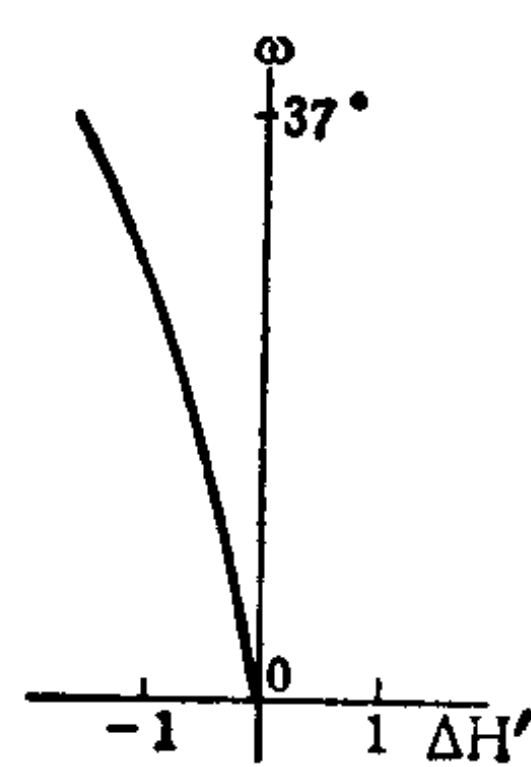
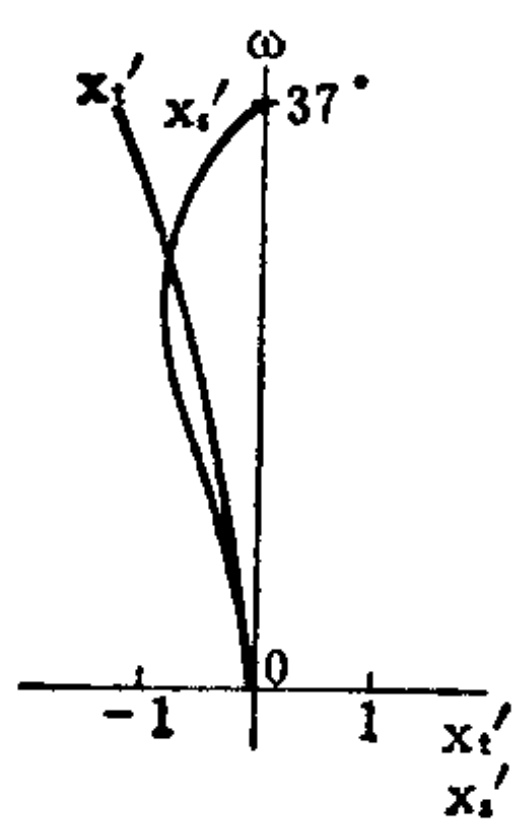
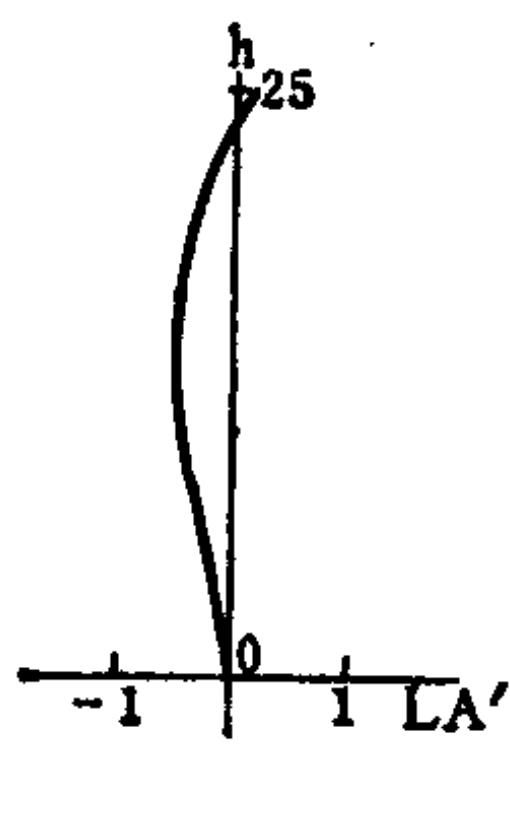
F.A. = $\pm 37^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	152.802	15.74	1.64000	60.3	10	3194.398	21.77	1.78800	47.5
2	651.702	0.53			11	-82.032	4.58		
3	184.493	5.00	1.50378	66.8	12	-75.997	3.79	1.76182	26.6
4	43.128	13.30			13	223.486	6.63		
5	80.507	7.31	1.50378	66.8	14	-233.989	10.43	1.69680	55.6
6	55.504	27.73			15	-74.255	0.53		
7	329.365	3.72	1.50378	66.8	16	447.901	10.43	1.69680	55.6
8	67.631	31.60	1.72000	46.0	17	-187.702			
9	∞	13.76*							

$$13.76^* = 7.00 + 6.76$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.2849	0.1032	-0.0078	-0.2598	-1.1749	75.3	-2.2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.176	-1.650	-1.343	-0.038	-1.305	-0.1854	-0.0483
70	-0.490	-0.950	-0.676	-0.759	0.083	-0.3319	-0.0306



编号: 07-02-038

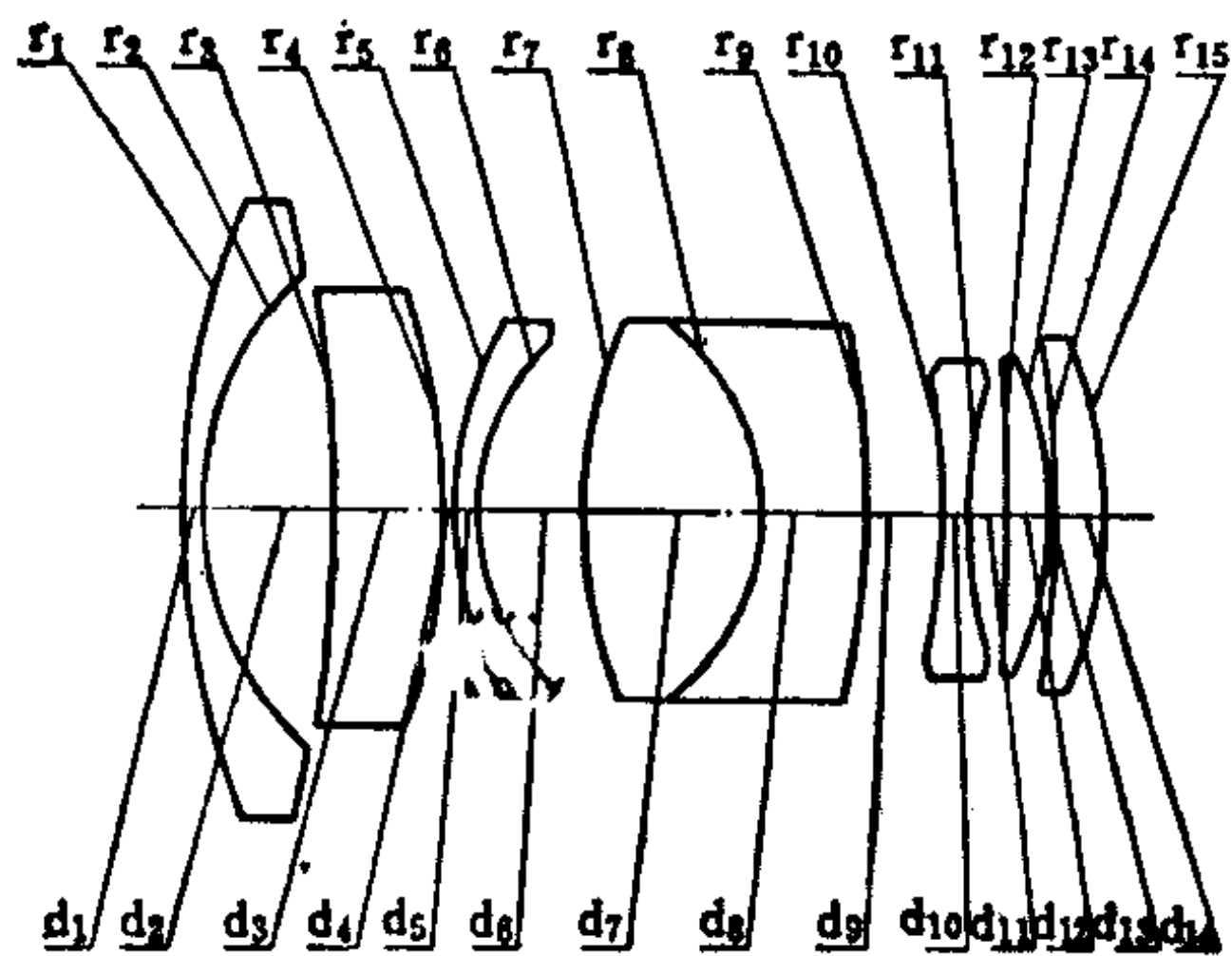
广角照相物镜

E.F.L = 100

B.F.L = 127.64

FNo. = 2

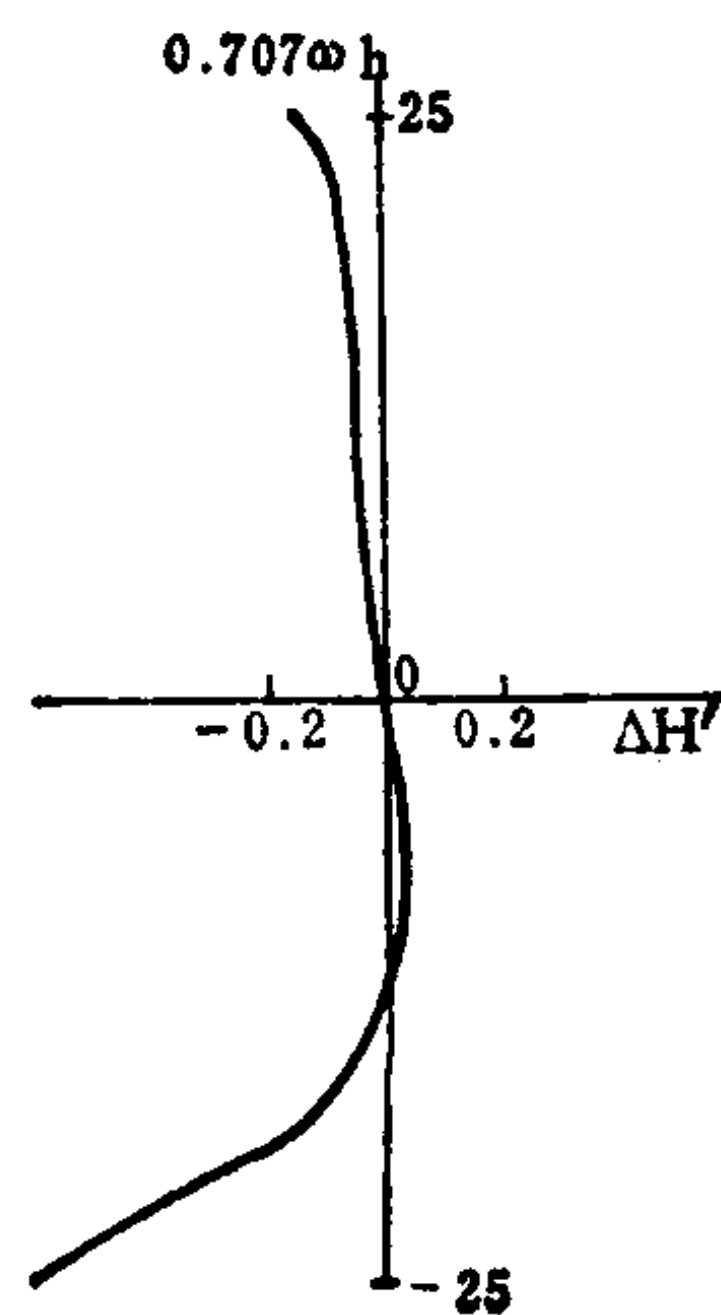
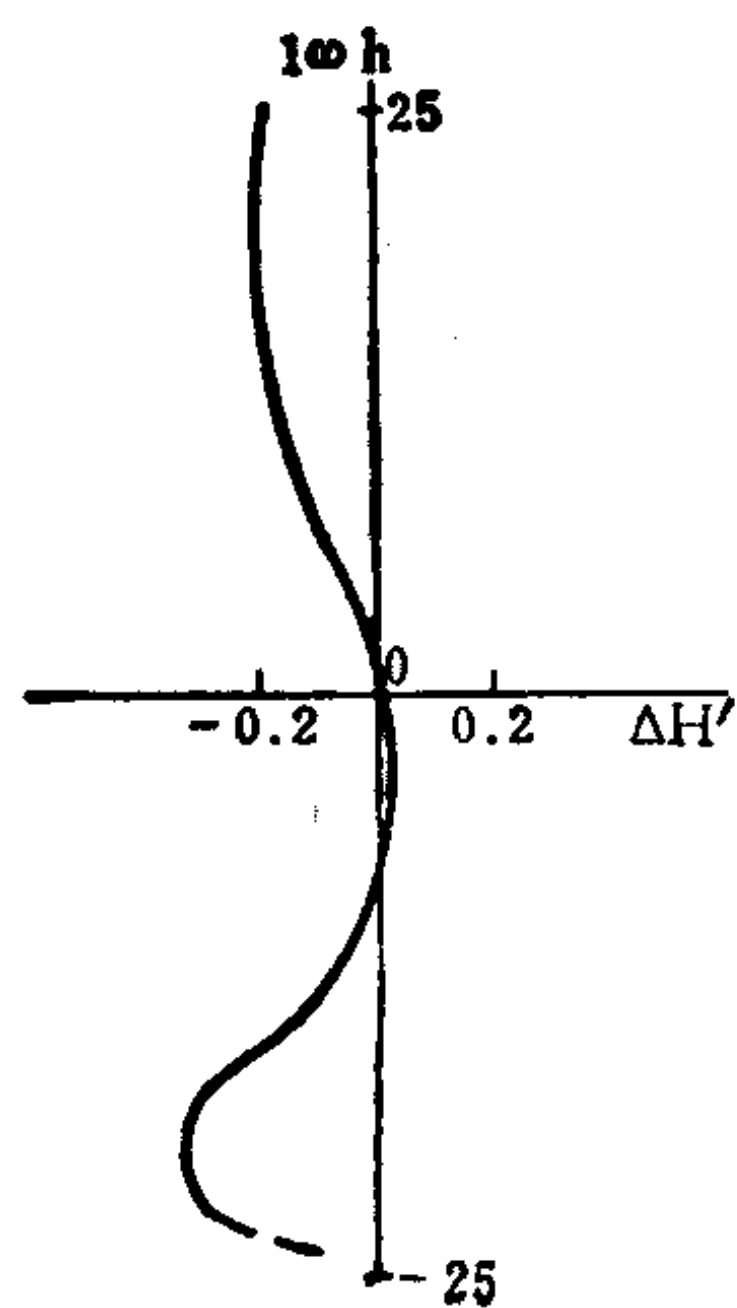
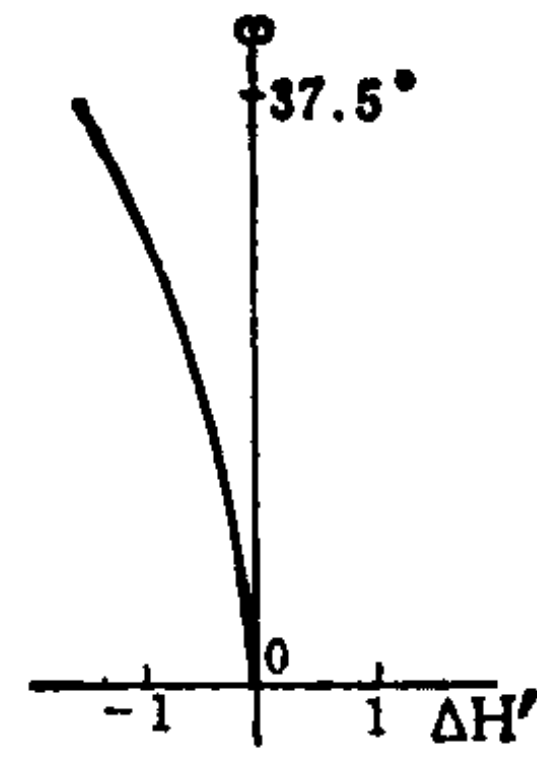
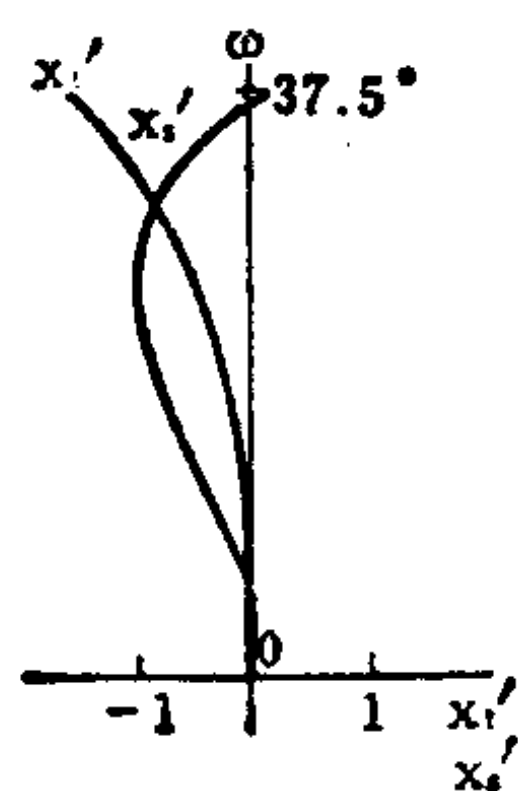
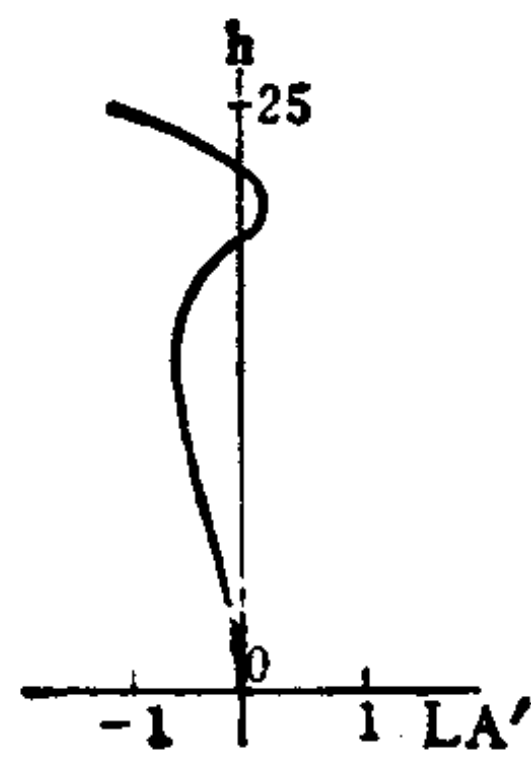
F.A. = $\pm 37.5^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	199.730	4.126	1.49831	65.0	9	-196.956	17.754*		
2	68.296	30.168			10	-124.352	4.161	1.84666	23.9
3	-305.836	24.273	1.68250	44.7	11	146.676	8.461		
4	-206.318	3.710			12	-274.954	8.842	1.73400	51.5
5	85.301	4.161	1.71300	53.9	13	-77.738	0.347		
6	52.914	23.683			14	-1074.933	9.536	1.71300	53.9
7	104.026	38.455	1.80610	40.9	15	-115.465			
8	-52.914	24.481	1.72342	38.0					

$$17.754^* = 8.000 + 9.754$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.38299	0.09468	0.07912	-0.38976	-1.00043	76.7	-1.9%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-1.227	-1.522	-1.582	0.170	-1.752	0.5740	-0.2701
70	-0.372	-0.796	-0.569	-0.982	0.413	-0.3702	-0.0974



编号: 07-02-039

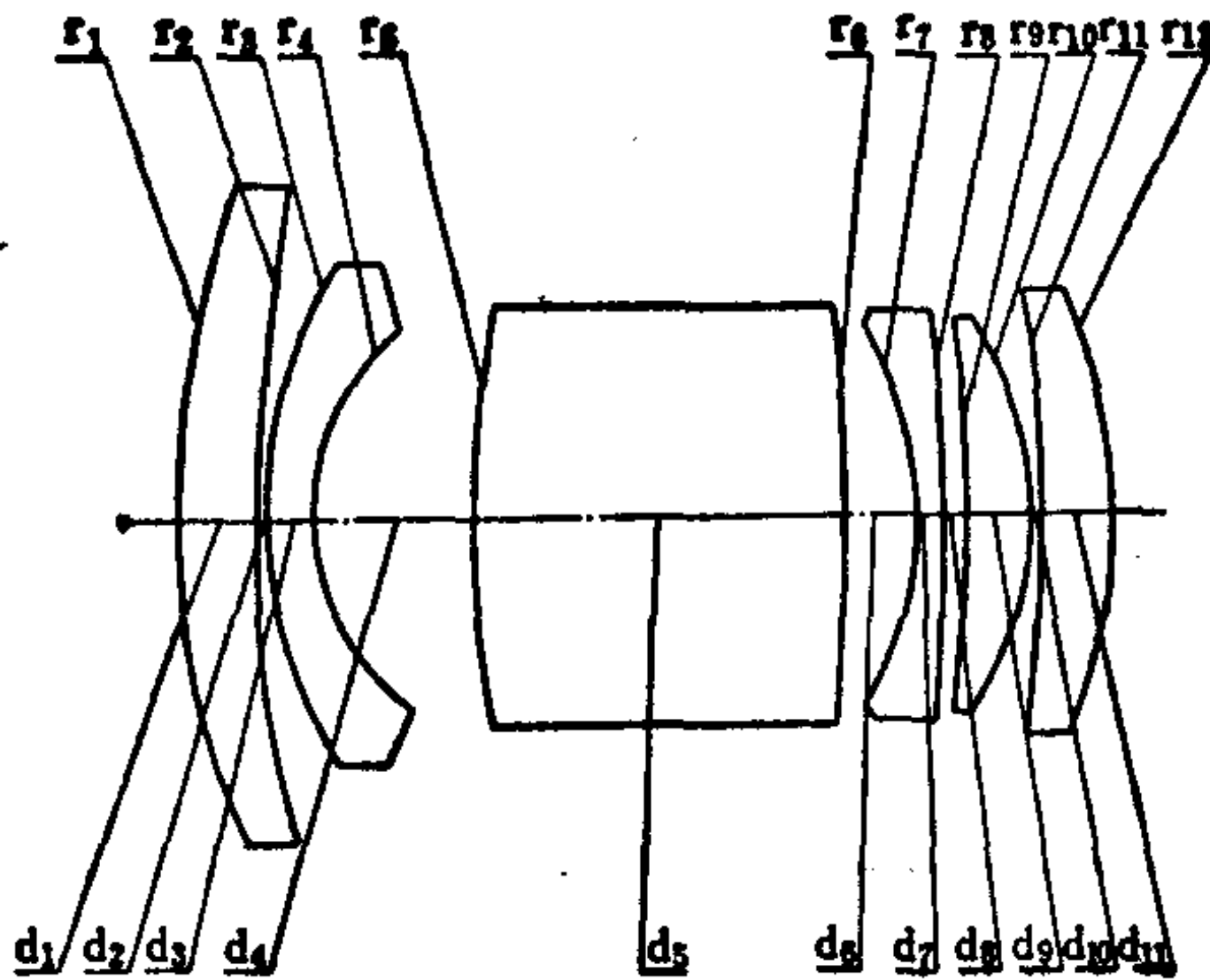
反远距型广角物镜

E.F.L = 1

B.F.L = 1.32

FNo. = 3.5

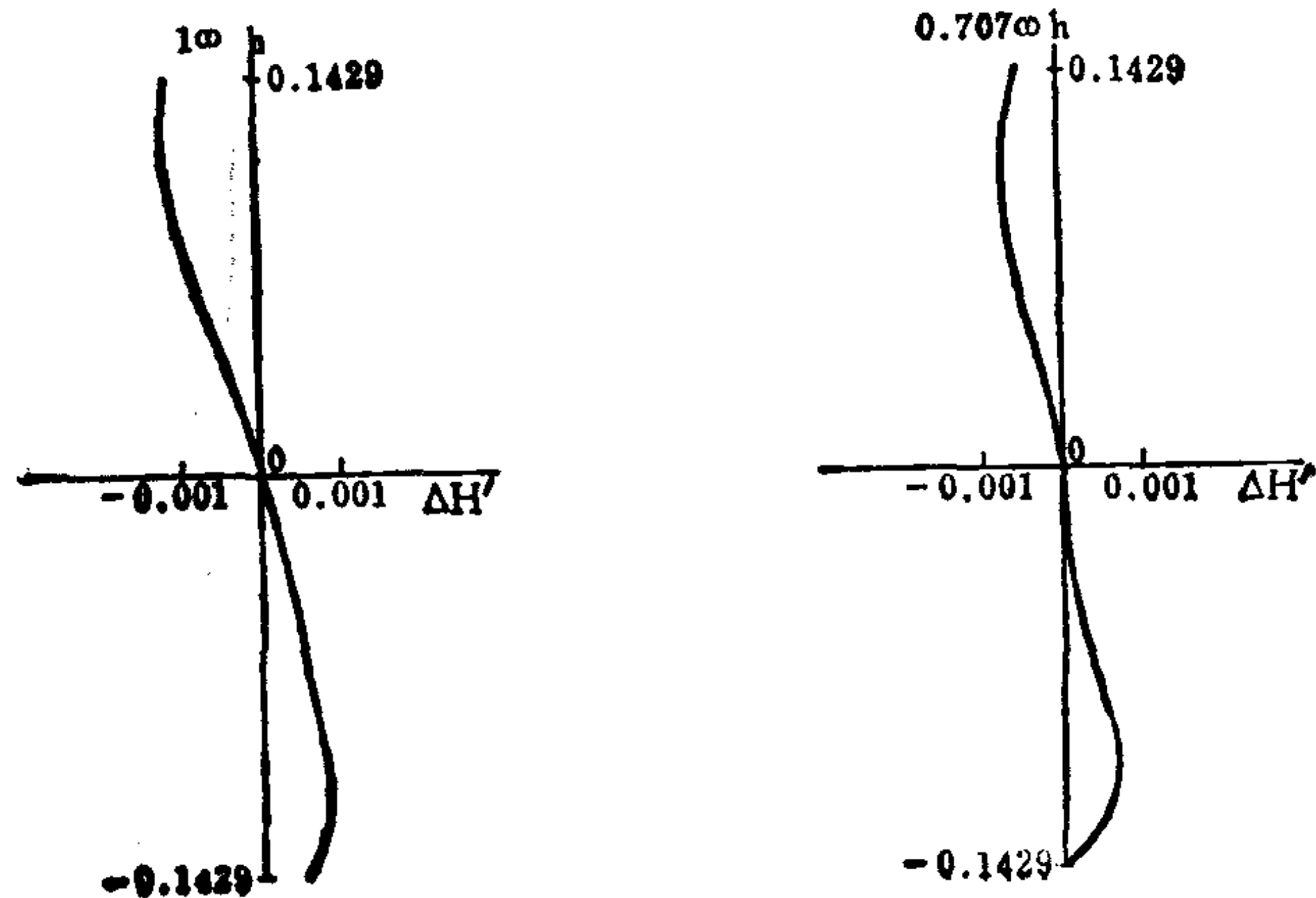
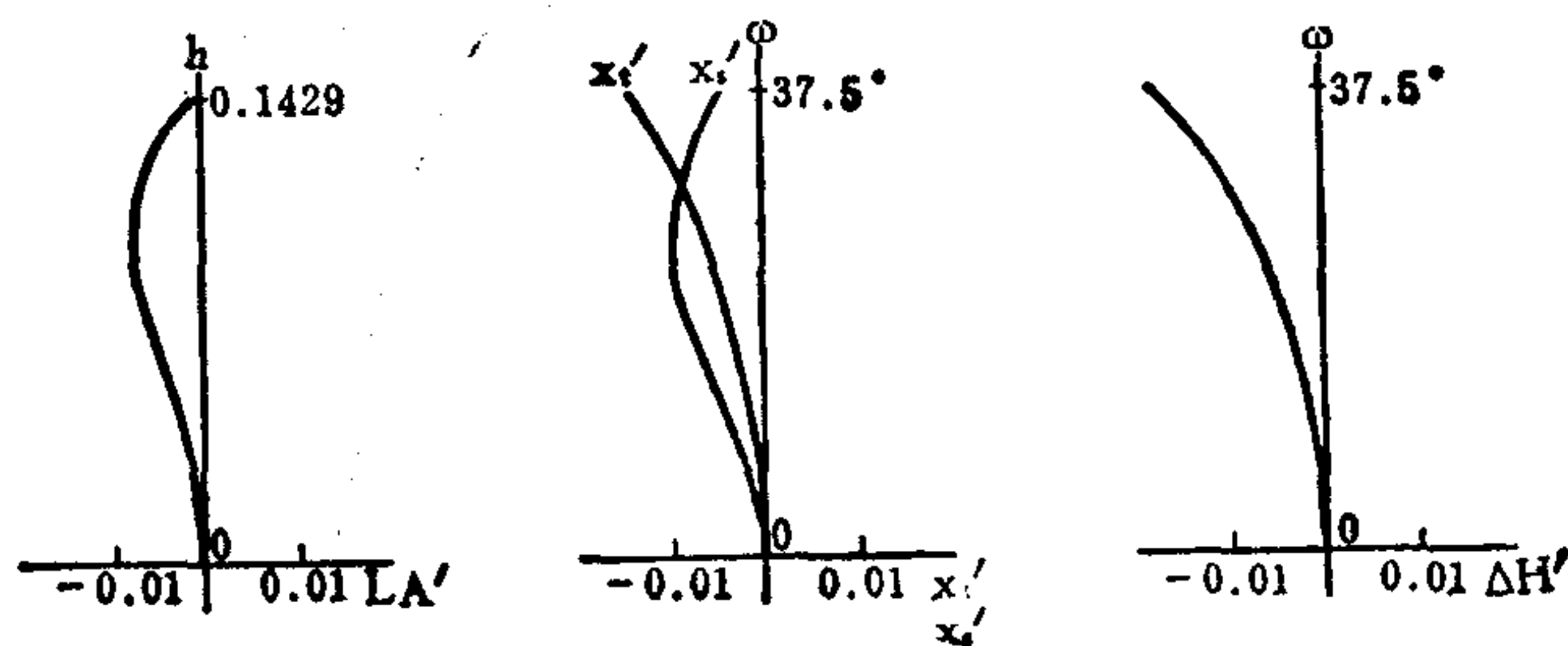
F.A. = $\pm 37.5^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	0.98629	0.10574	1.7432	49.4	7	-0.56679	0.04406	1.78472	25.7
2	2.18620	0.00353			8	-115.8307	0.02579		
3	0.64888	0.05287	1.51835	60.3	9	-2.28218	0.07190	1.67000	57.3
4	0.27280	0.19667			10	-0.44600	0.00353		
5	8.13576	0.45926	1.80518	25.4	11	-3.07504	0.07930	1.67000	57.3
6	-2.38235	0.07049*			12	-0.67634			

$$0.07049^* = 0.01000 + 0.06049$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.000868	0.000377	0.000196	-0.001275	-0.005378	0.77	-2.4%
h 或 ω %	LA'	$\Delta H'$	x'_i	x'_s	$x'_i - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00128	-0.01874	-0.01443	-0.00456	-0.00987	-0.000209	-0.000134
70	-0.00682	-0.00790	-0.00587	-0.00965	0.00378	-0.000218	0.000014



编号: 07-02-040

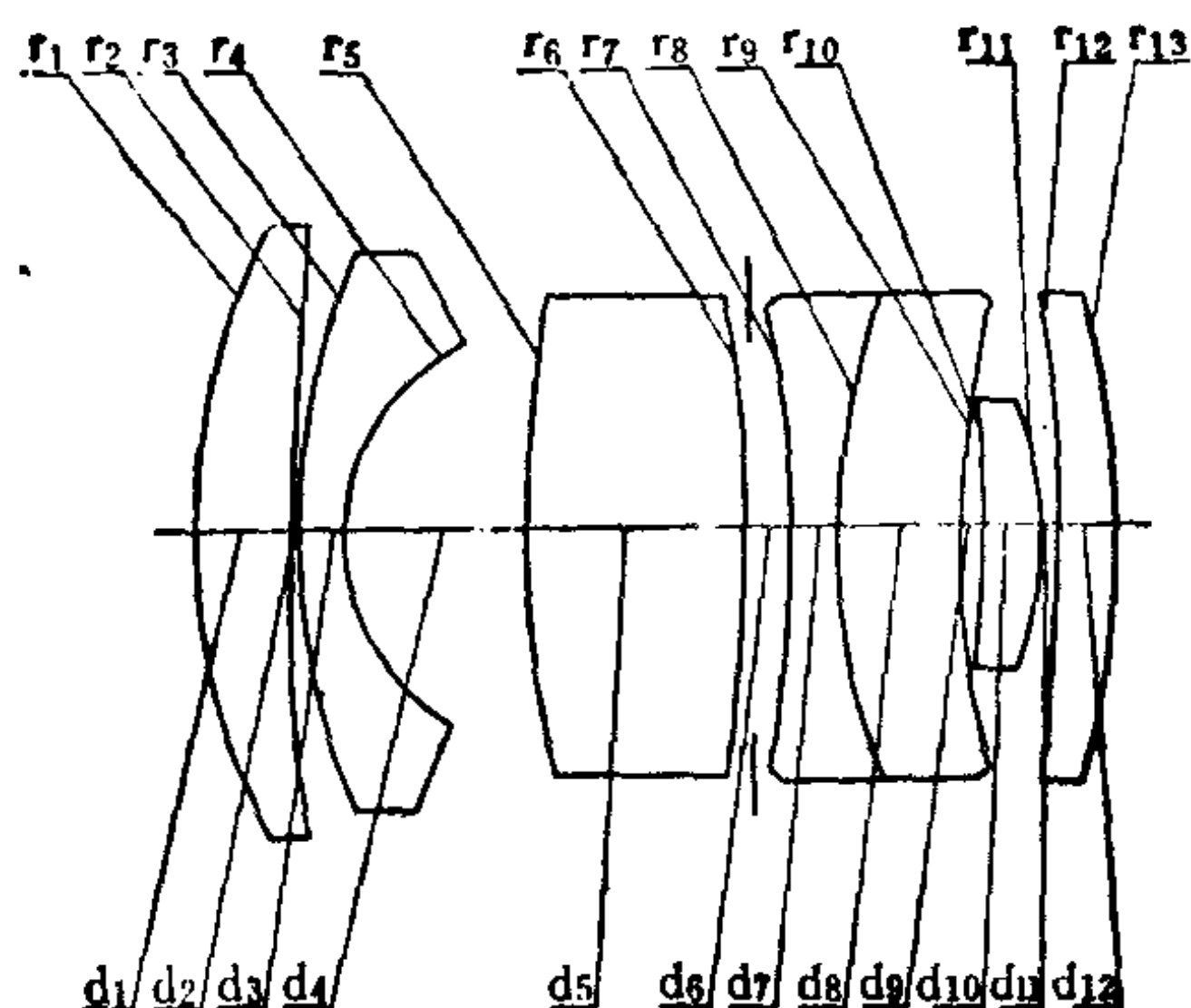
反远距型广角物镜

E.F.L = 1

B.F.L = 1.31586

FNo. = 3.5

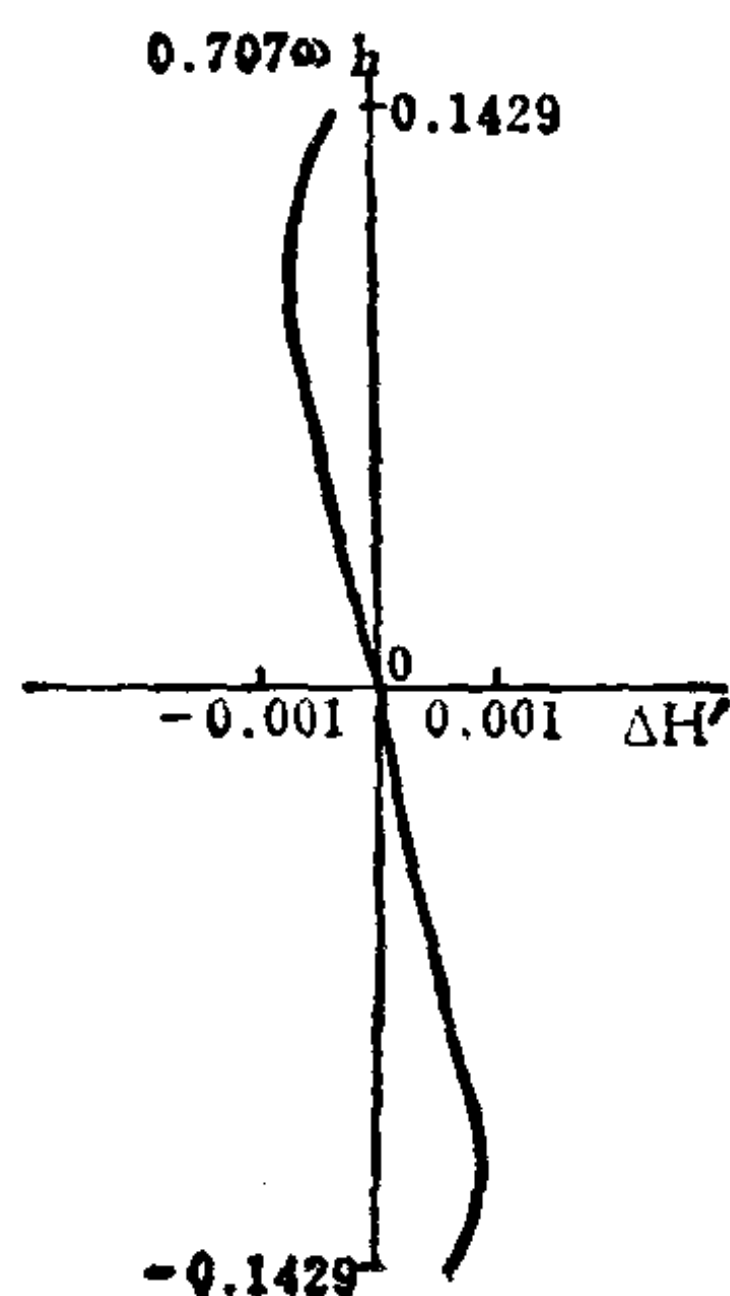
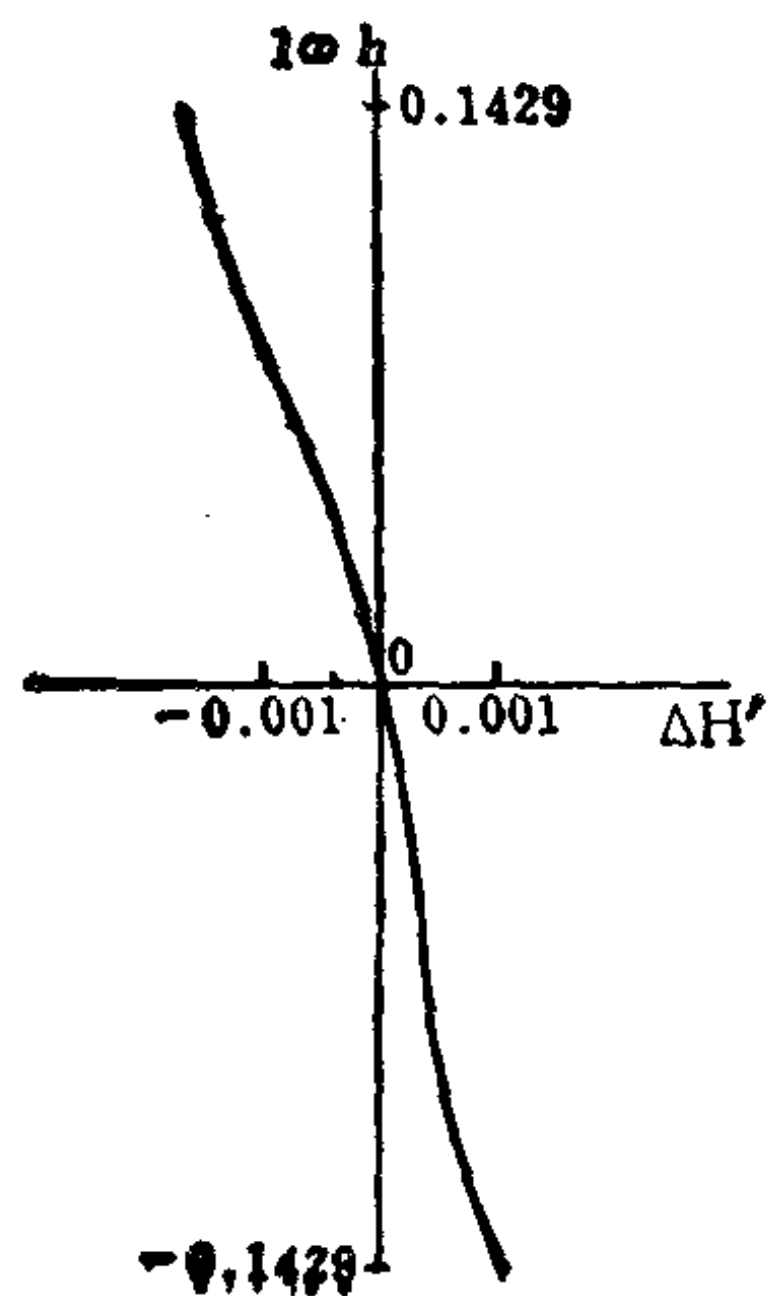
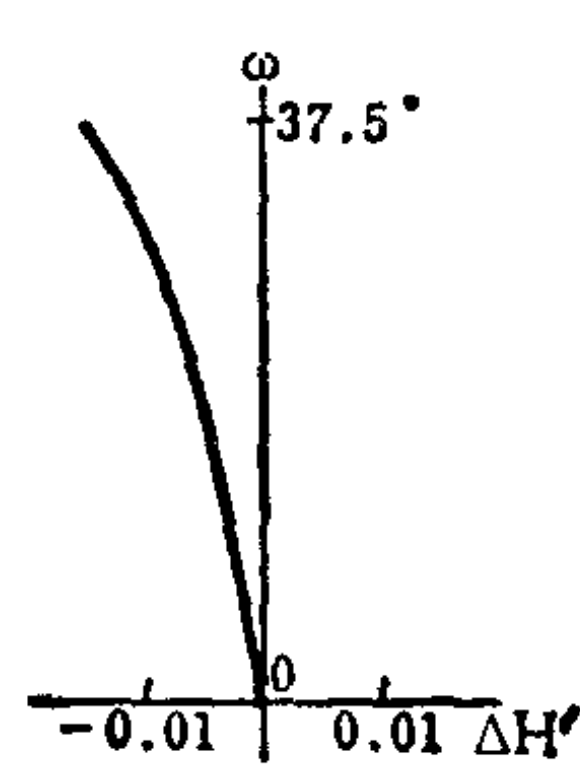
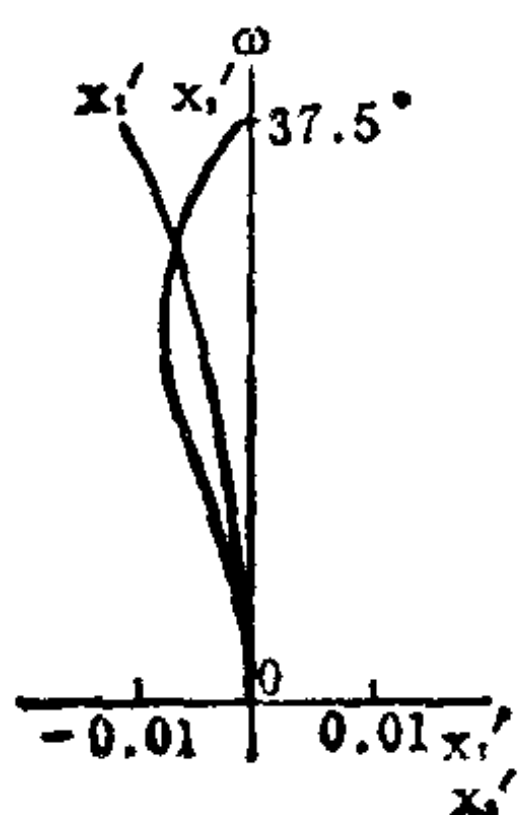
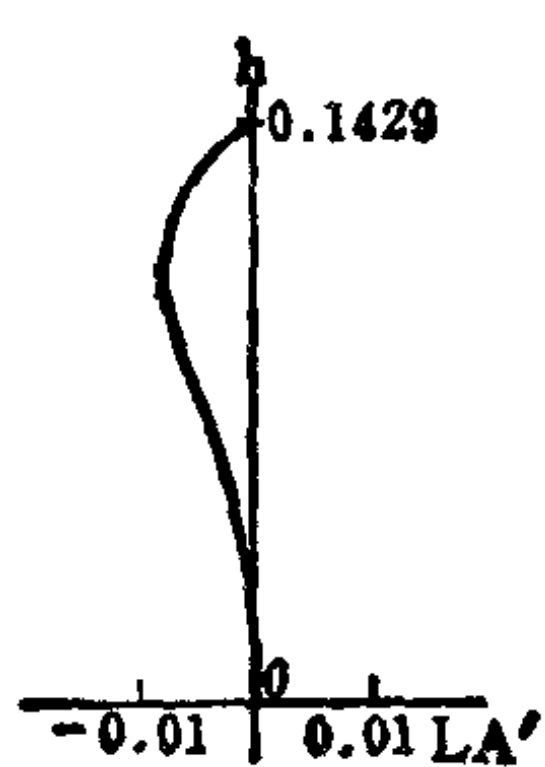
F.A. = $\pm 37.5^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	0.77899	0.10990	1.72000	43.7	8	0.79942	0.14716	1.78590	44.1
2	2.21704	0.00351			9	9.96285	0.01898		
3	0.99337	0.05263	1.51835	60.3	10	-1.94162	0.08362	1.67000	57.3
4	0.25837	0.21618			11	-0.45292	0.00351		
5	2.37382	0.25923	1.78472	25.7	12	-3.10087	0.07274	1.67000	57.3
6	-19.16816	0.06070*			13	-1.06628			
7	-1.31411	0.05263	1.78472	25.7					

0.06070* = 0.01000 + 0.05070

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.001006	0.000191	0.000168	-0.000959	-0.006046	0.76	-2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00076	-0.01561	-0.01157	-0.00261	-0.00896	-0.000400	-0.000347
70	-0.00775	-0.00840	-0.00596	-0.00785	0.00189	0.000040	-0.000003



编号: 07-02-041

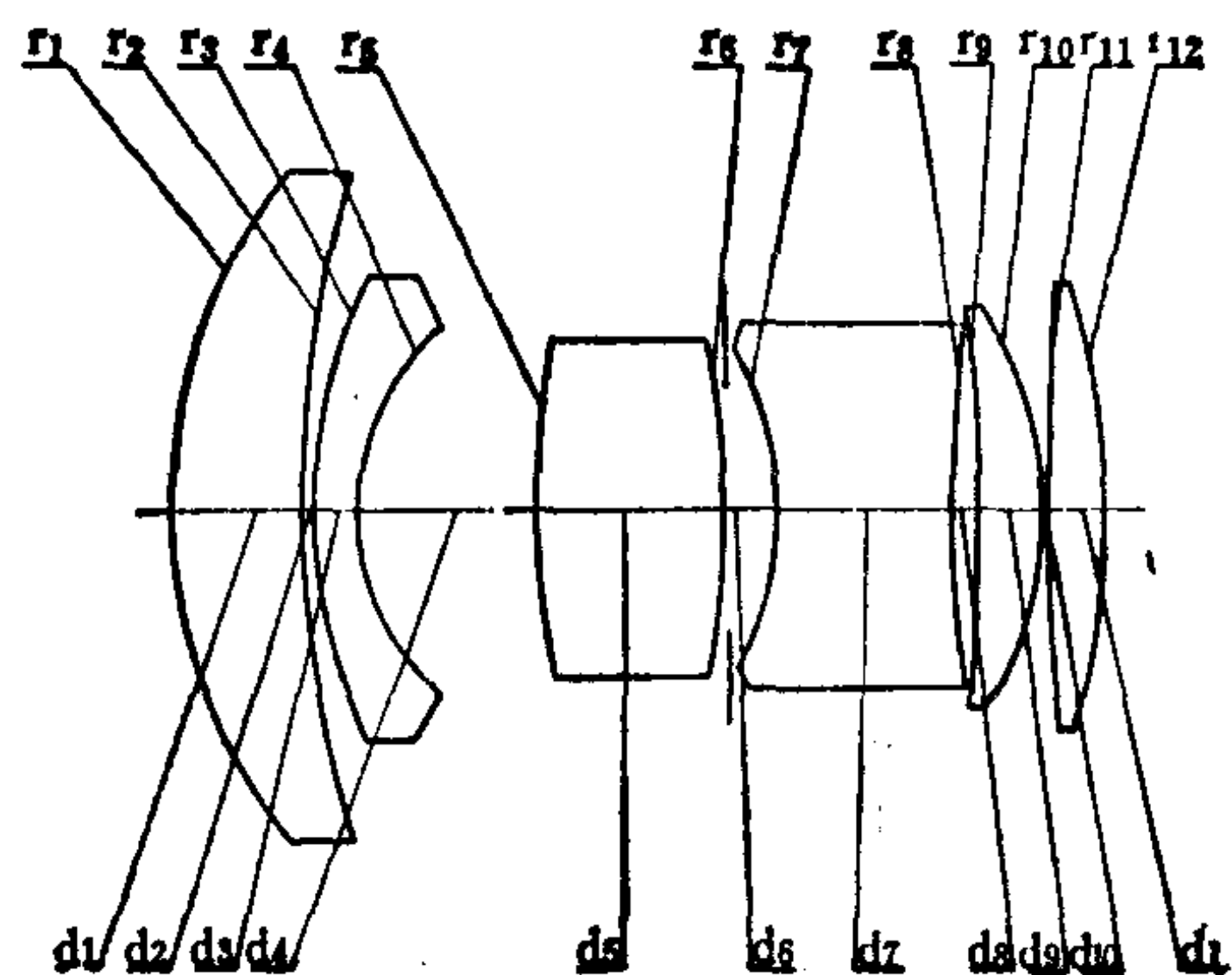
反远距型广角物镜

E.F.L=1

B.F.L=1.07463

FNo.=2

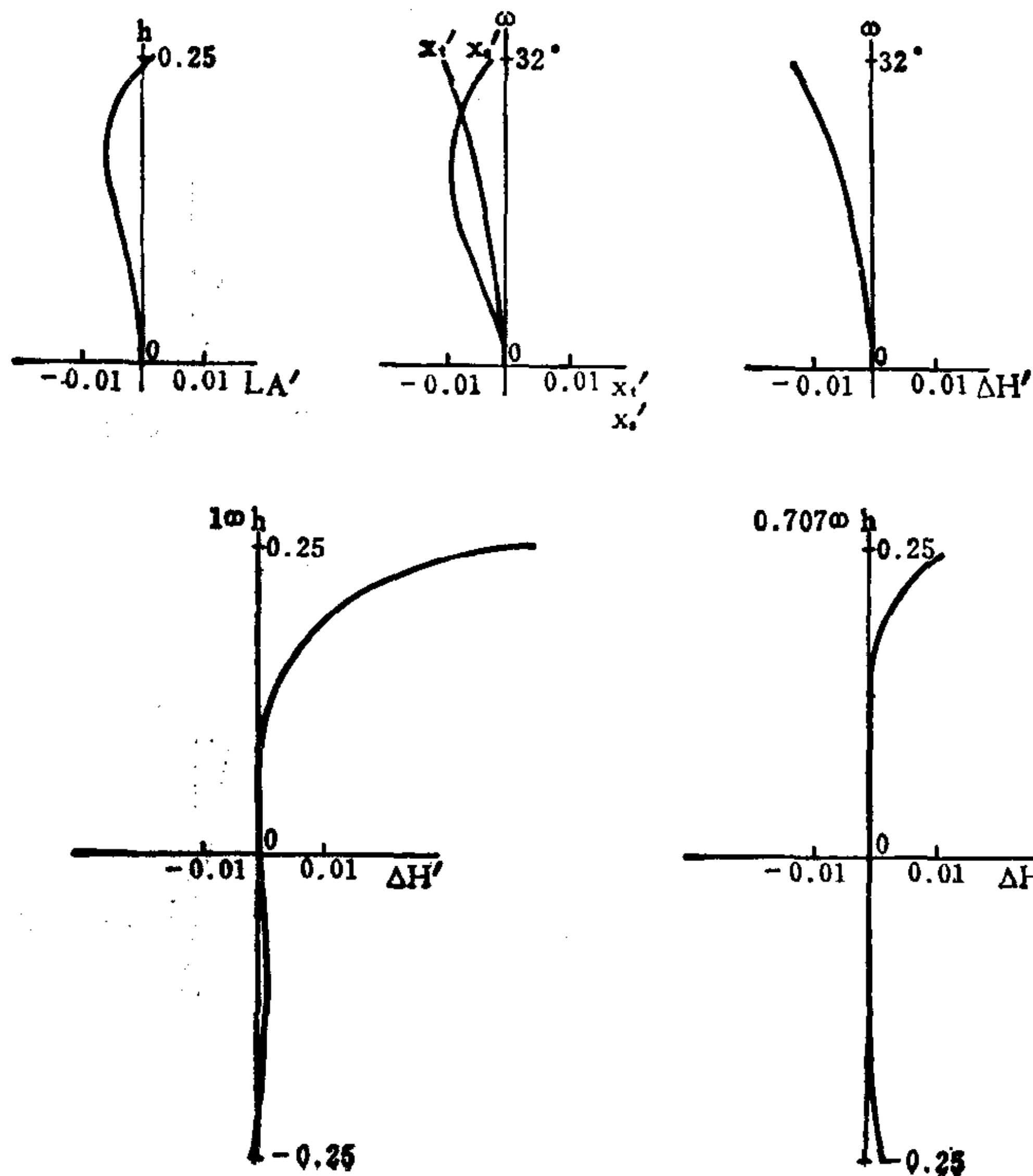
F.A.=±32°



序号	r	d	n	v	序号	r	d	n	v
1	0.78816	0.20003	1.72000	50.3	7	-0.52950	0.27462	1.78472	25.7
2	2.12468	0.00400			8	4.55068	0.01938		
3	0.98386	0.05715	1.51835	60.3	9	-16.67865	0.09939	1.71300	53.9
4	0.36128	0.28096			10	-0.59009	0.00286		
5	2.69252	0.27296	1.80610	40.9	11	3.19140	0.08344	1.71300	53.9
6	-4.93715	0.08567*			12	-1.19632			

0.08567* = 0.01000 + 0.07567

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.002182	-0.000128	0.000891	-0.003932	-0.007776	0.62	-2.1%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.00192	-0.01309	-0.01065	-0.00272	-0.00793	0.022249	0.004188
70	-0.00575	-0.00607	-0.00577	-0.00984	0.00407	0.007458	0.000903



编号: 07-02-042

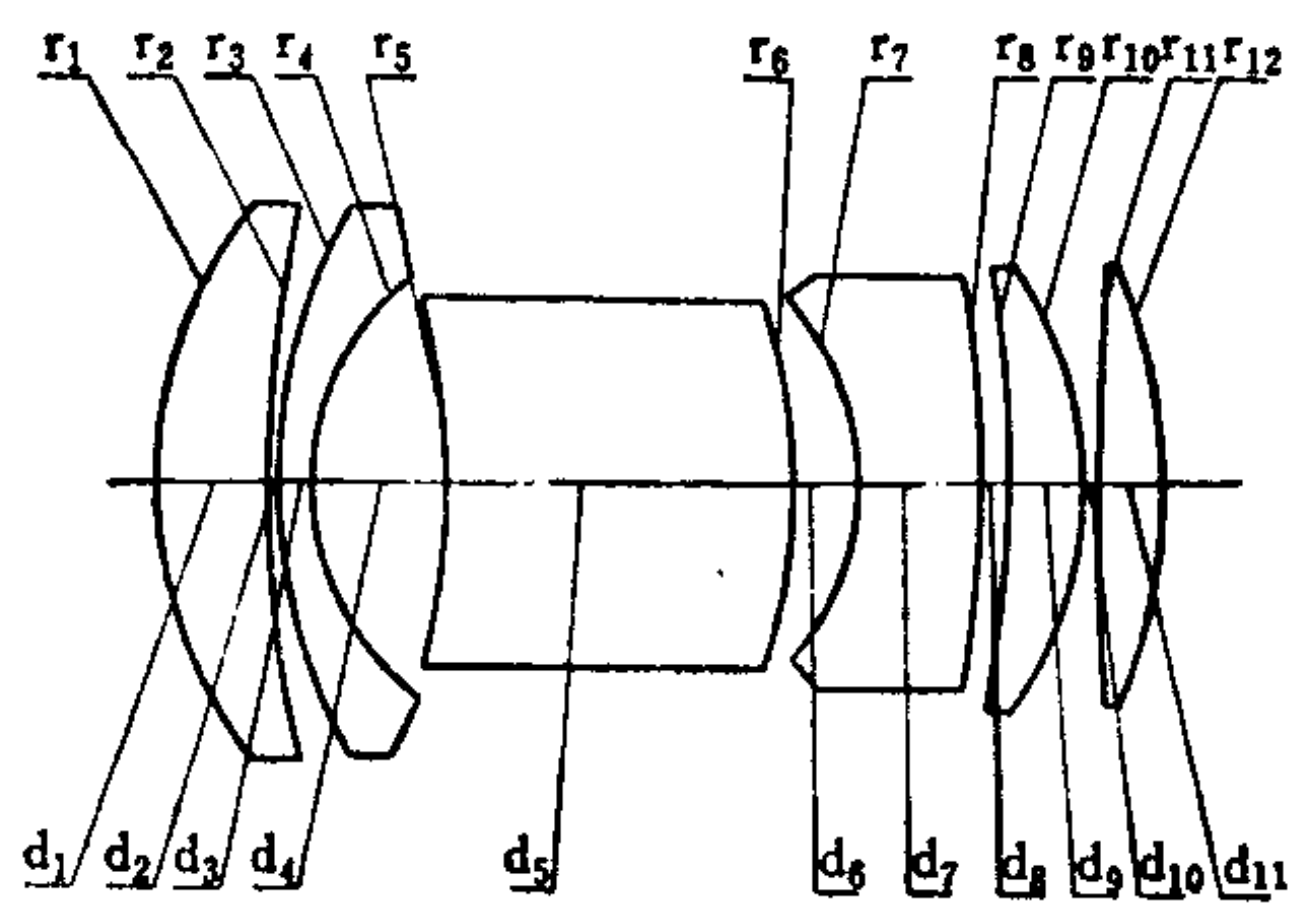
反远距型广角物镜

E.F.L=1

B.F.L=1.0872

FNo.=2.8

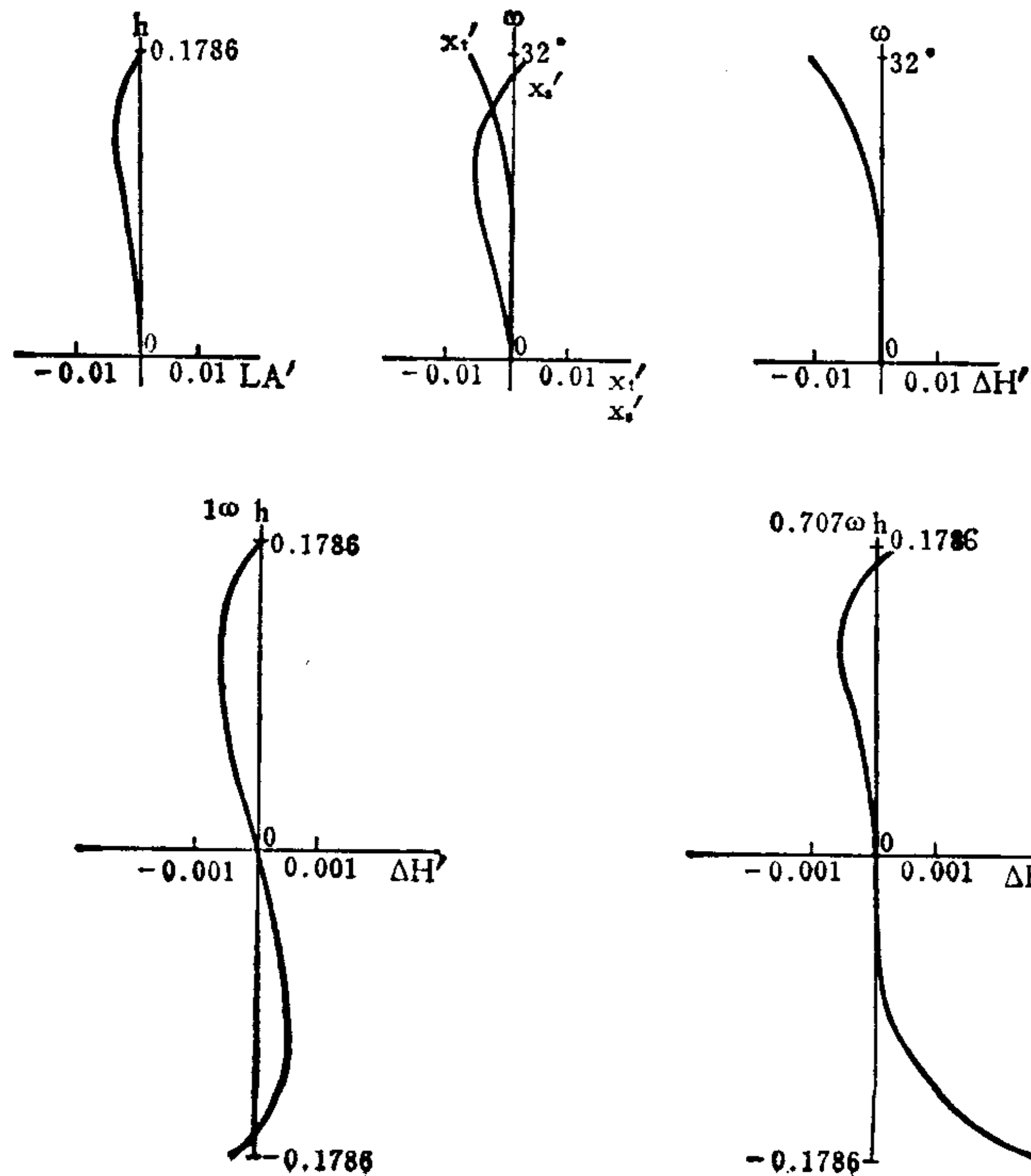
F.A.=±32°



序号	r	d	n	v	序号	r	d	n	v
1	0.54727	0.11265	1.7432	49.4	7	-0.36042	0.13997	1.80518	25.4
2	1.42131	0.00282			8	-4.60381	0.02619		
3	0.62407	0.04224	1.51454	54.7	9	-1.18720	0.06928	1.63854	55.4
4	0.27143	0.14335			10	-0.40325	0.00282		
5	-7.48458	0.37287	1.80518	25.4	11	37.32366	0.06421	1.63854	55.4
6	-1.25726	0.05604*			12	-0.63641			

$$0.05604^* = 0.02600 + 0.03004$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.000899	-0.000041	0.000552	-0.001677	-0.003592	0.62	-2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00009	-0.01265	-0.00777	0.00250	-0.01027	-0.000130	-0.000033
70	-0.00452	-0.00428	-0.00198	-0.00596	0.00398	0.001755	0.000072



编号: 07-02-043

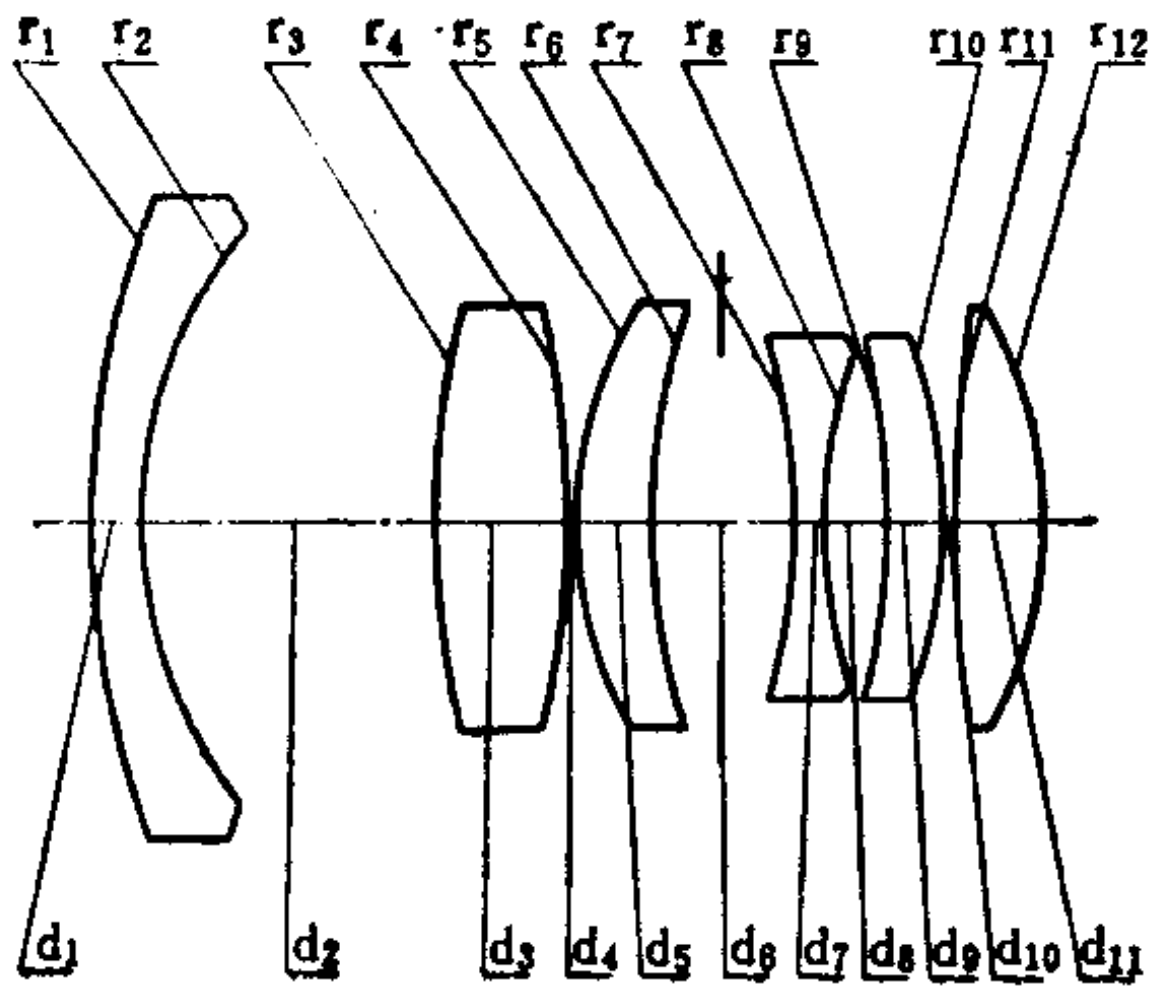
体积小重量轻的反远距型广角物镜

E.F.L=100

B.F.L=109.50

FNo.=2.8

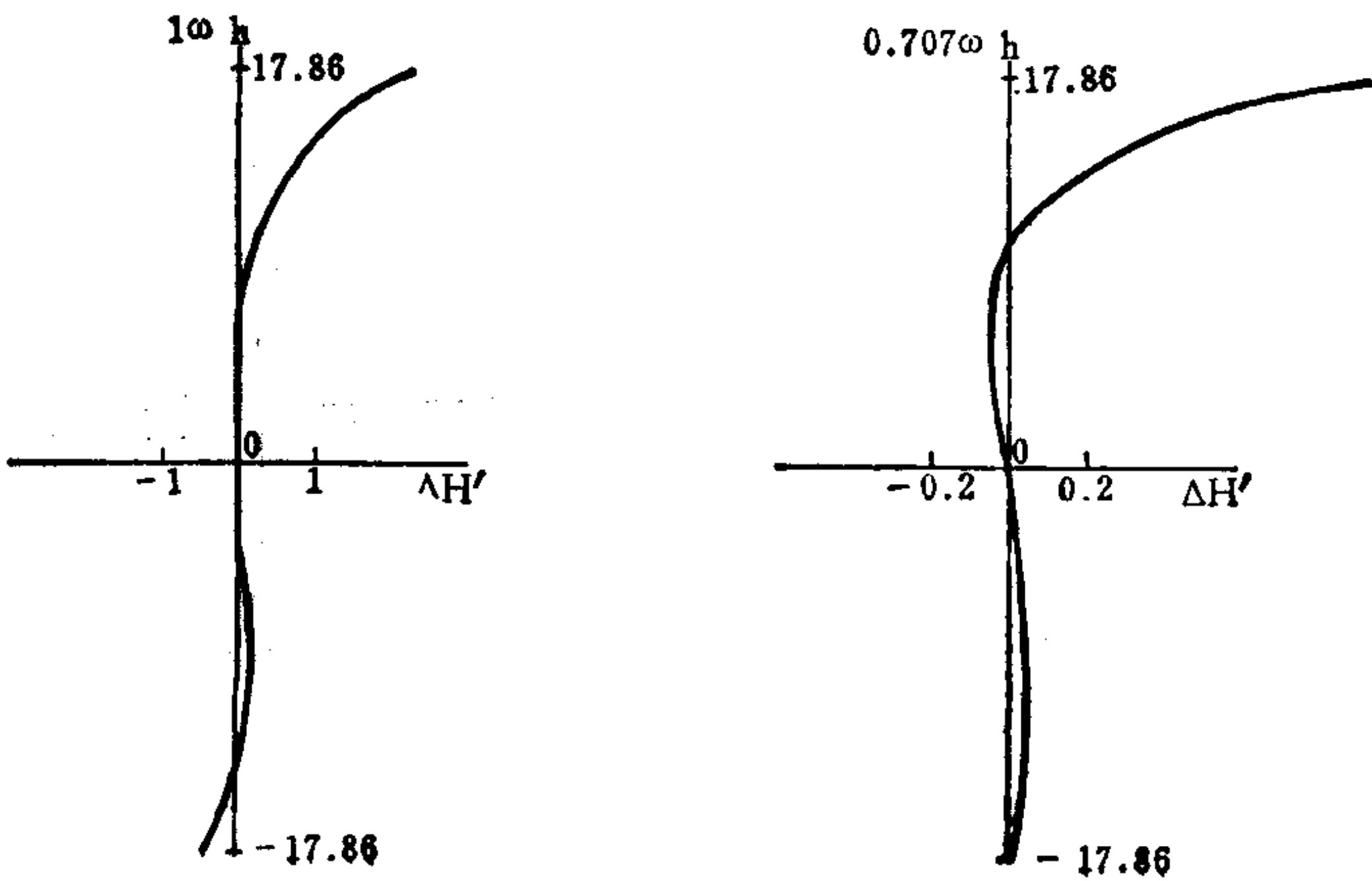
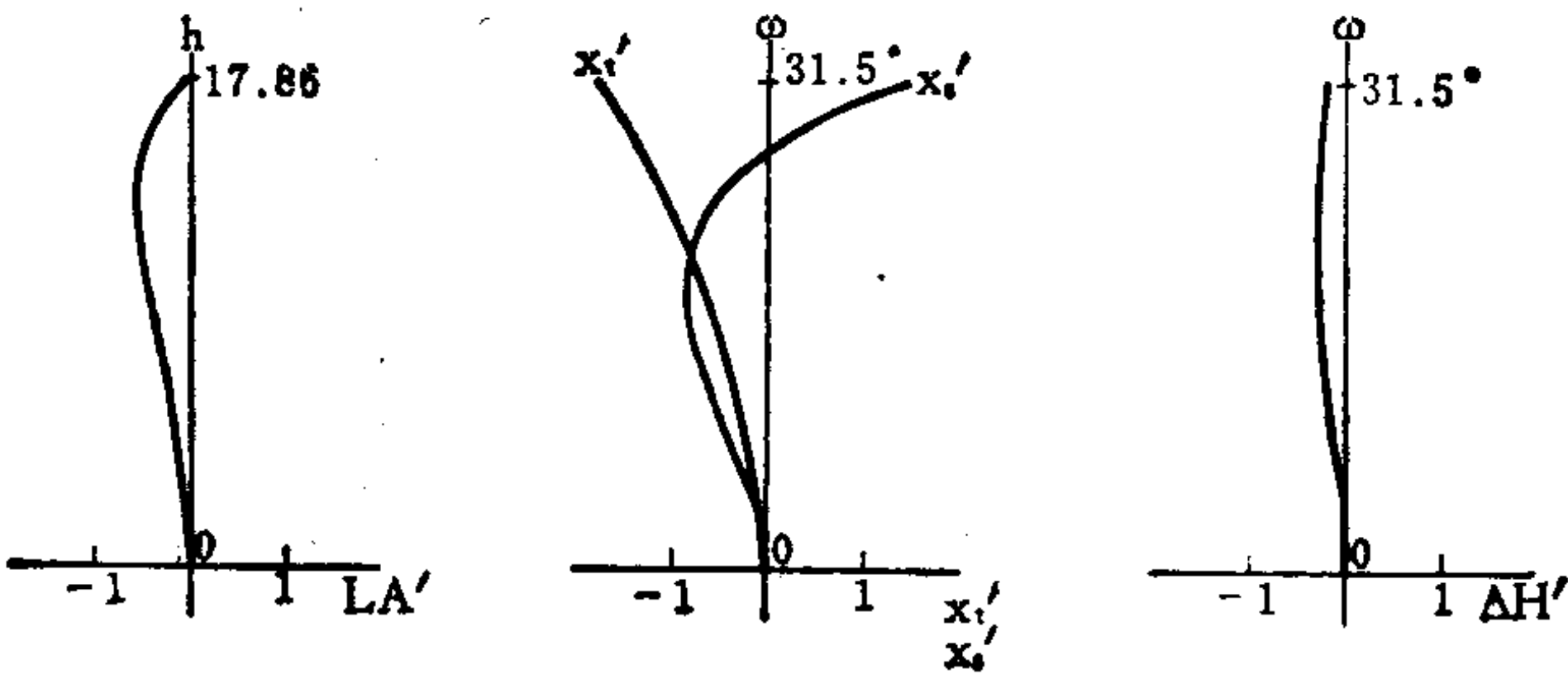
F.A.=±31.5°



序号	r	d	n	v	序号	r	d	n	v
1	113.67	4.25	1.51633	64.0	7	-63.39	3.40	1.71736	29.5
2	47.25	32.55			8	84.24	5.09		
3	192.81	13.02	1.75700	47.8	9	-148.20	7.08	1.62041	60.2
4	-149.93	0.57			10	-66.76	0.28		
5	48.38	8.10	1.63930	44.8	11	1179.40	9.34	1.62041	60.2
6	63.54	15.00*			12	-50.45			

15.00* = 8.00 + 7.00

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.09739	-0.02754	0.01726	-0.20372	-0.29501	61.3	-0.3%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K τ_1	K $\tau_{0.7}$
100	0.0189	-0.2021	-1.834	1.394	-3.228	0.9451	0.2986
70	-0.5148	-0.2513	-0.898	-0.825	-0.073	0.5222	0.0683



编号: 07-02-044

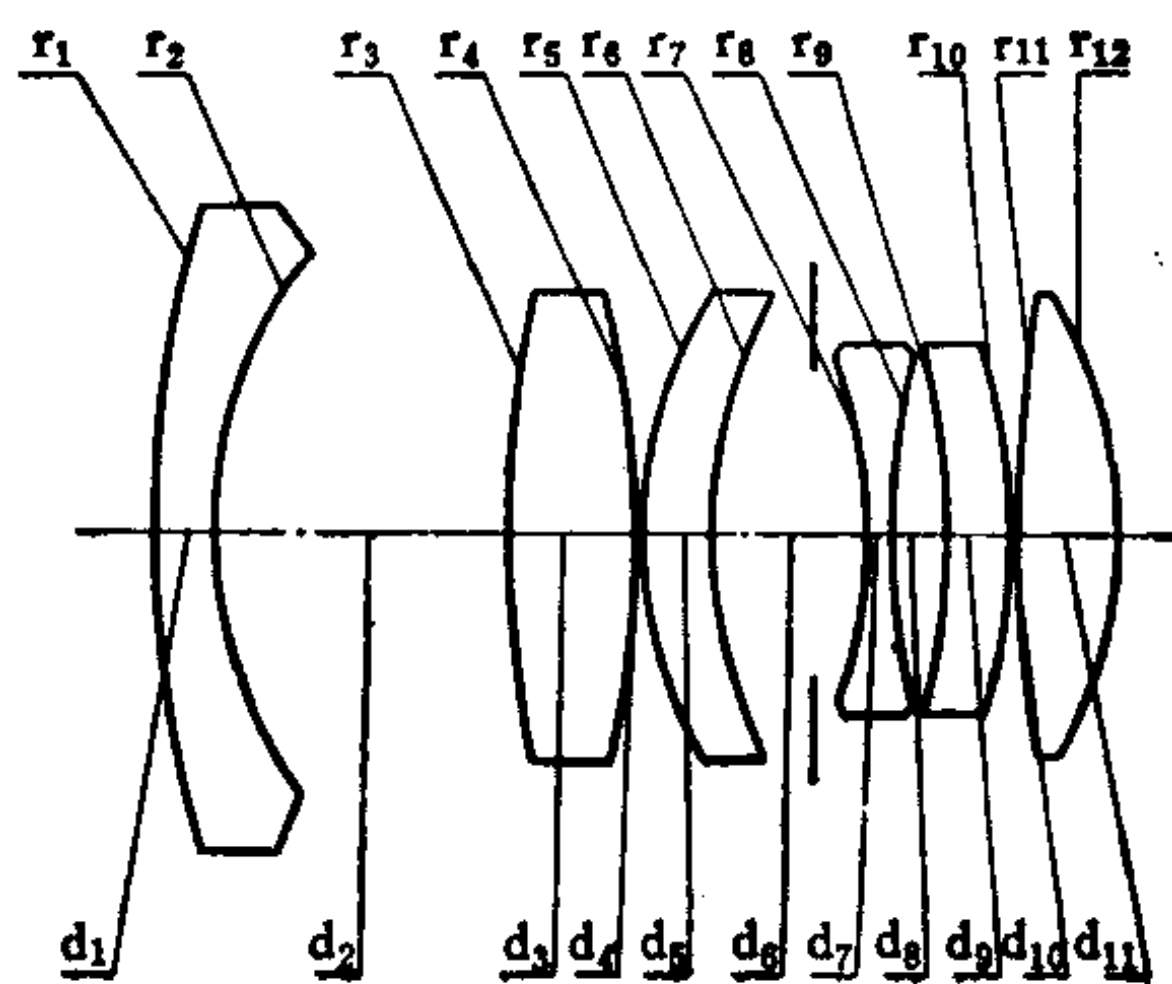
体积小重量轻的反远距型广角物镜

E.F.L=100

B.F.L=109.3

FNo.=2.8

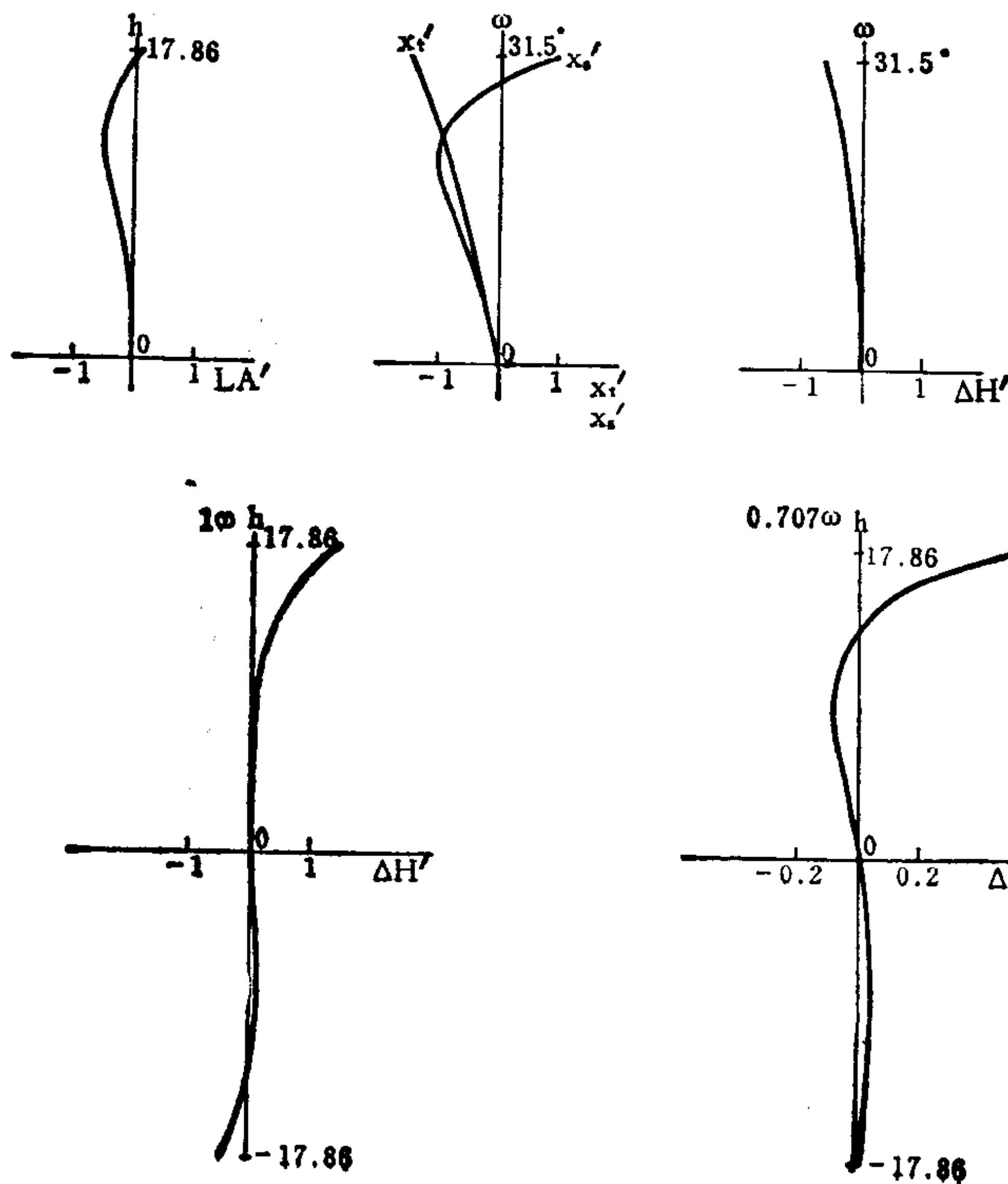
F.A.=±31.5°



序号	r	d	n	v	序号	r	d	n	v
1	123.16	5.64	1.51633	64.0	7	-62.75	3.38	1.71736	29.5
2	47.88	31.02			8	86.78	5.08		
3	149.62	12.97	1.67003	47.3	9	-136.25	7.05	1.62041	60.2
4	-149.62	0.56			10	-64.25	0.28		
5	48.21	8.07	1.63930	44.8	11	575.60	9.31	1.62041	60.2
6	63.31	14.95*			12	-52.23			

14.95* = 8.00 + 6.95

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.09174	-0.04022	0.02068	-0.22831	-0.36935	61.3	-1%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.1304	-0.6591	-1.534	0.892	-2.426	0.5195	0.1387
70	-0.4557	-0.3632	-0.925	-1.015	0.090	0.2774	-0.0115



编号: 07-02-045

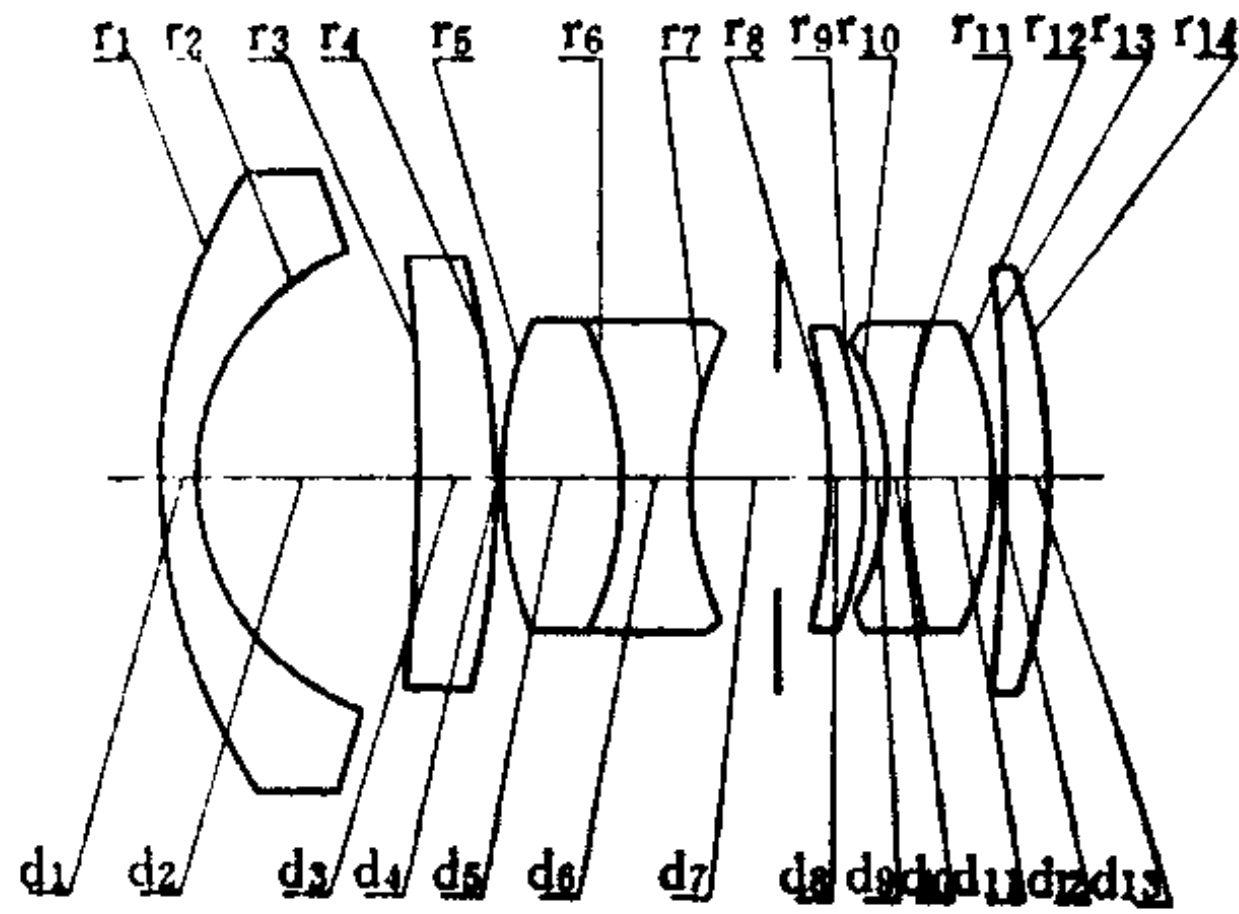
反远距型广角物镜

E.F.L=100

B.F.L=110.52

FNo.=2.8

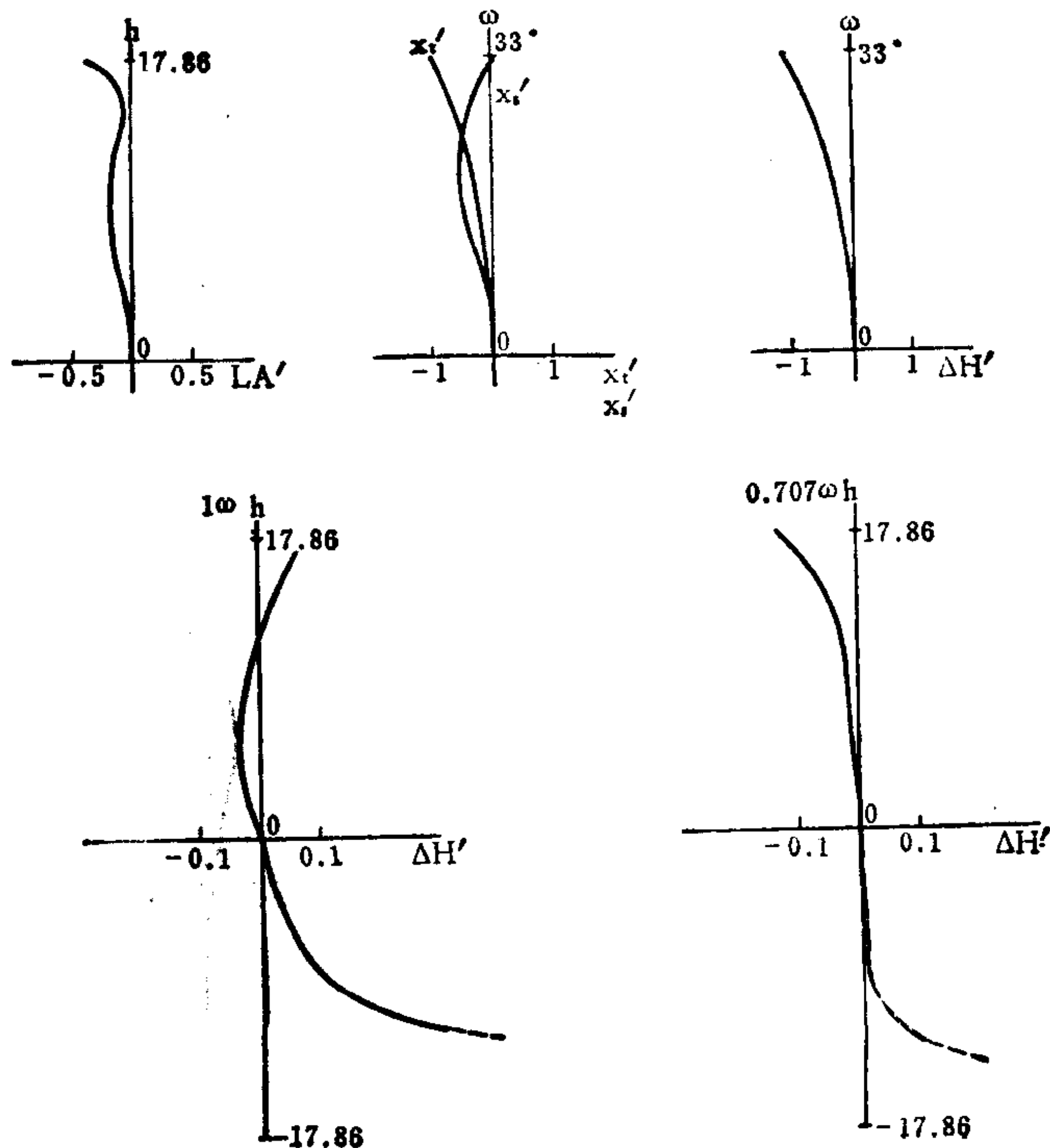
F.A.=±33°



序号	r	d	n	v	序号	r	d	n	v
1	74.668	4.545	1.51633	64.1	8	-125.275	5.455	1.69350	53.2
2	32.895	29.060			9	-51.944	2.182		
3	-3515.000	9.822	1.58144	40.7	10	-34.223	2.727	1.72342	38.0
4	-189.645	0.364			11	176.154	10.000	1.51633	64.1
5	64.922	14.653	1.77250	49.6	12	-41.447	0.364		
6	-46.939	9.128	1.56732	42.8	13	-230.971	6.364	1.69350	53.2
7	52.318	16.915*			14	-74.175			

$$16.915^* = 9.000 + 7.915$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.07109	0.00175	0.02046	-0.12054	-0.43756	64.9	-1.6%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.412	-1.089	-0.974	0.084	-1.058	-47.7986	0.2405
70	-0.153	-0.479	-0.372	-0.517	0.145	2.9197	0.0195



编号: 07-02-046

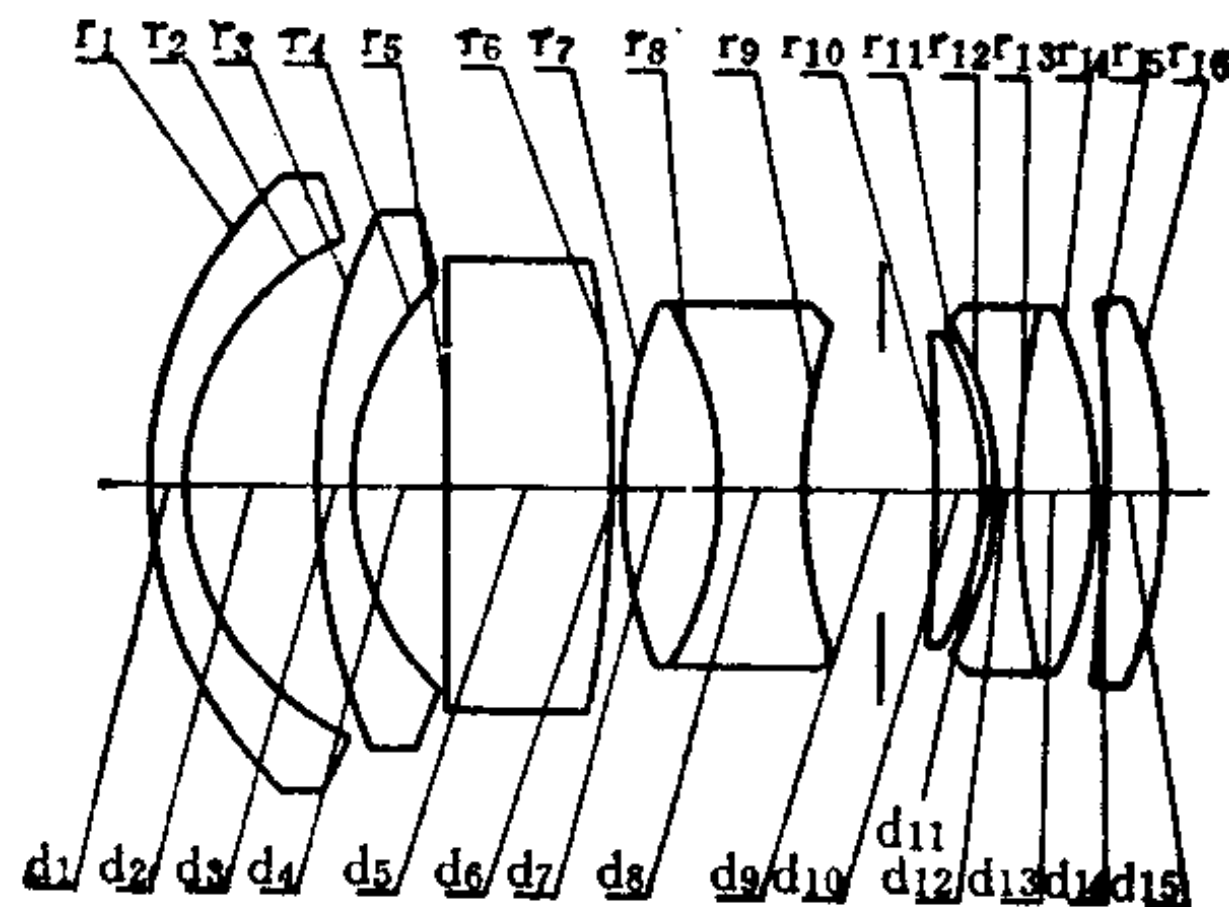
反远距型广角物镜

E.F.L = 100

B.F.L = 129.36

FNo. = 2.8

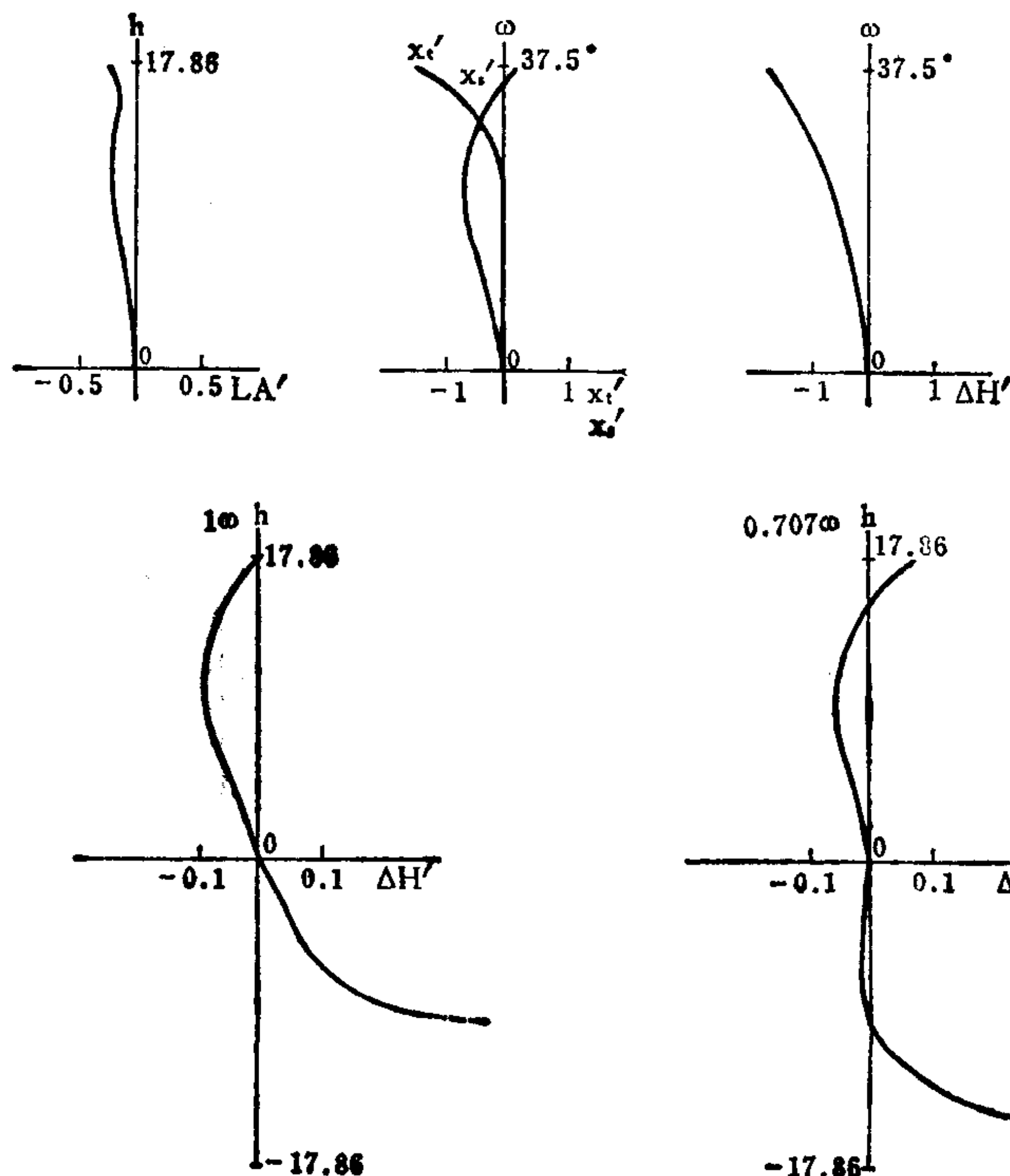
F.A. = $\pm 37.5^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	69.506	5.388	1.48749	70.1	9	92.675	20.475*		
2	42.797	20.496			10	-204.748	6.466	1.71300	53.9
3	118.969	5.388	1.48749	70.1	11	-70.563	1.789		
4	45.476	14.289			12	-49.247	3.233	1.83400	37.2
5	∞	27.113	1.56732	42.8	13	125.004	12.069	1.48749	70.1
6	-172.419	0.431			14	-54.415	0.431		
7	86.619	15.302	1.77250	49.6	15	-377.167	8.621	1.77250	49.6
8	-53.191	12.888	1.56732	42.8	16	-78.343			

20.475* = 10.000 + 10.475

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.06143	-0.03329	0.04593	-0.14955	-0.71092	76.7	-2.2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.212	-1.673	-1.418	0.135	-1.553	2.4935	0.4120
70	-0.191	-0.811	-0.087	-0.631	0.544	0.6943	0.0185



编号: 07-02-047

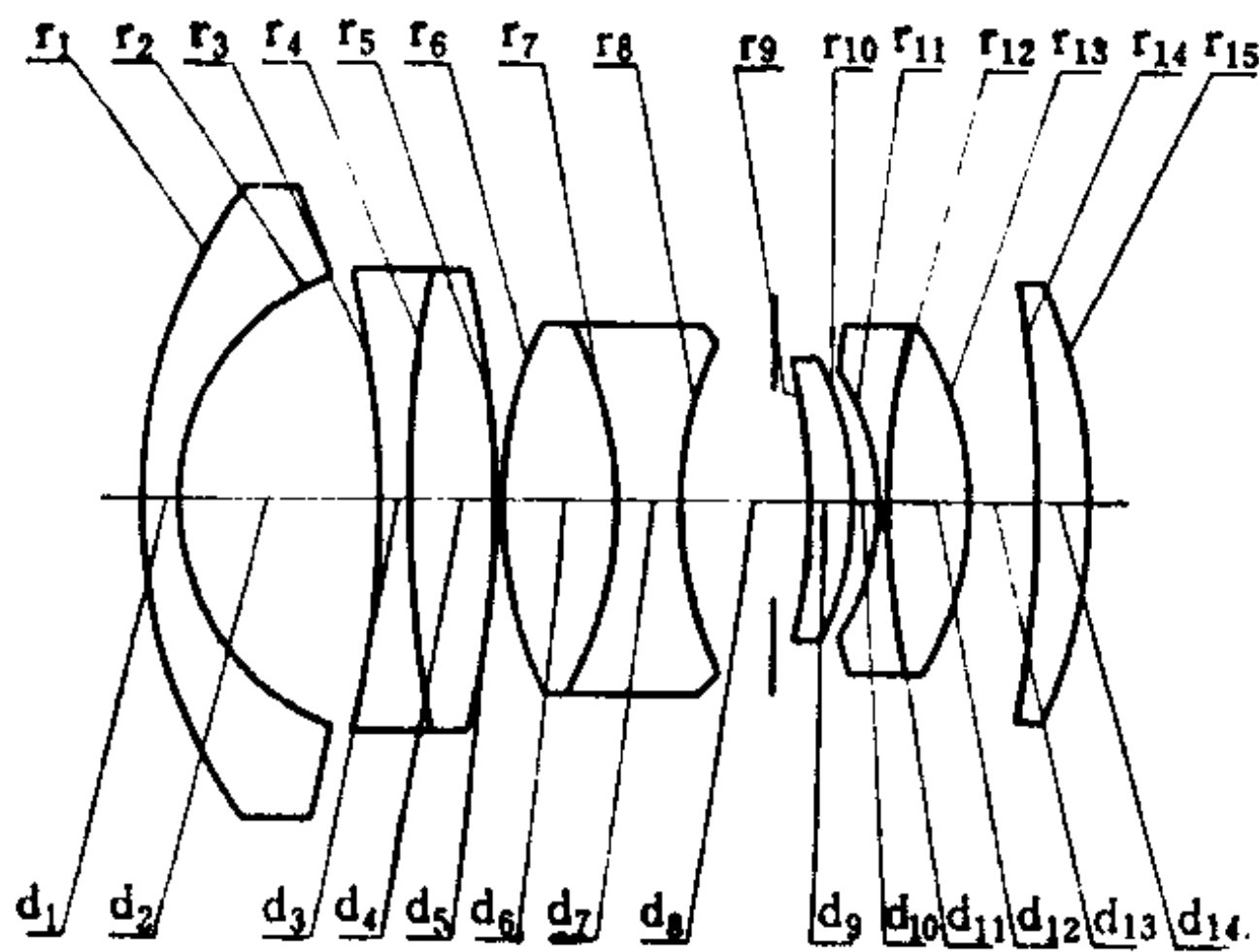
反远距型广角物镜

E.F.L = 100

B.F.L = 109.18

FNo. = 2.8

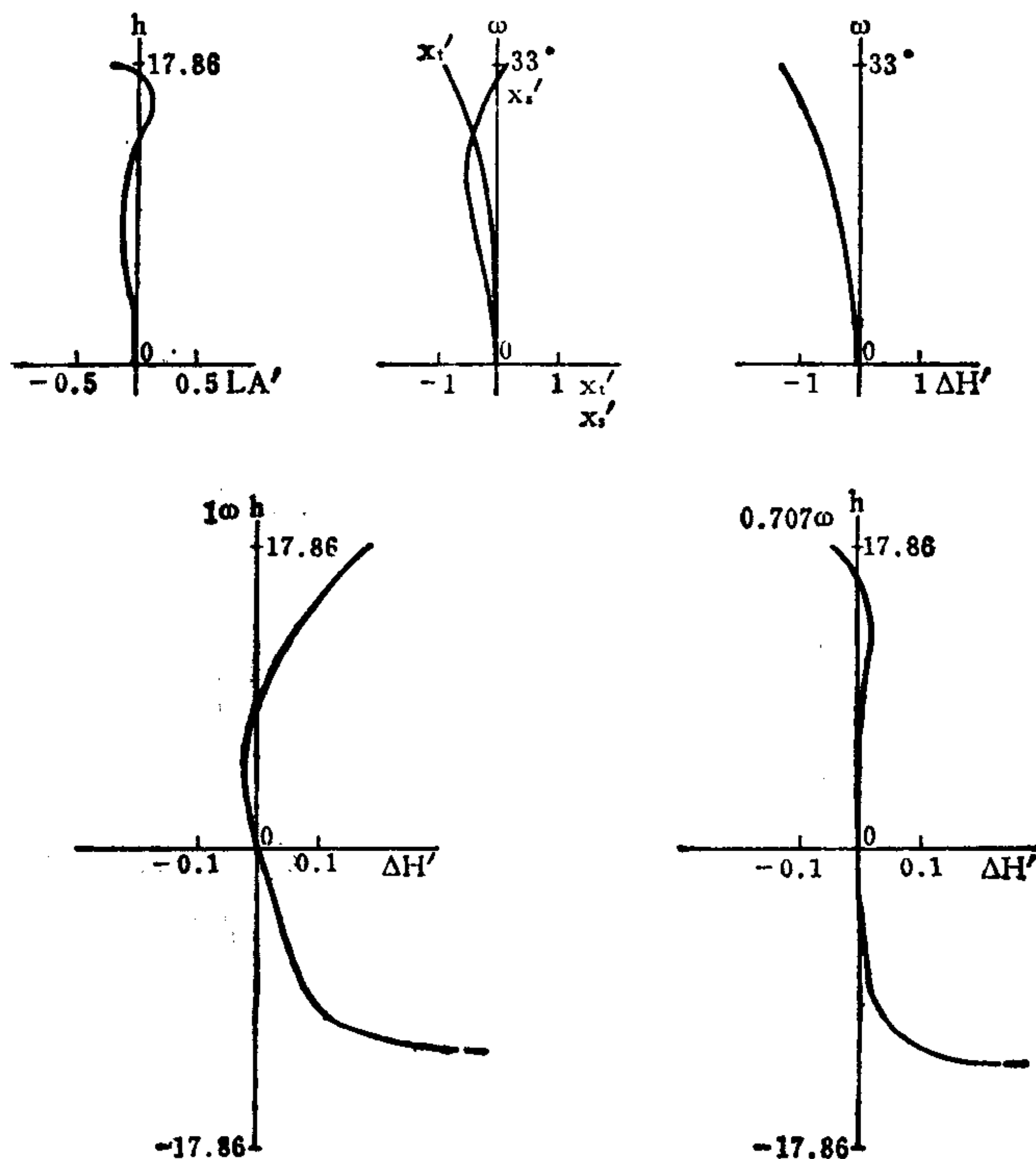
F.A. = $\pm 33^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	68.405	4.545	1.51633	64.1	9	-121.940	5.455	1.69350	53.2
2	32.462	25.486			10	-49.936	2.182		
3	-2050.000	5.455	1.51742	52.3	11	-33.182	2.723	1.72342	38.0
4	181.818	10.266	1.54814	45.8	12	276.178	10.000	1.51633	64.1
5	-187.273	0.364			13	-41.347	0.364		
6	61.843	14.653	1.77250	49.6	14	-227.273	6.364	1.69350	53.2
7	-46.913	7.874	1.56732	42.8	15	-73.983			
8	47.916	16.934*							

$$16.934^* = 9.000 + 7.934$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.05161	0.01684	0.02244	-0.11601	-0.47267	64.9	-2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.2019	-1.301	-0.855	0.121	-0.976	-47.5141	0.2500
70	0.0058	-0.532	-0.287	-0.464	0.177	3.5660	0.0677



编号: 07-02-048

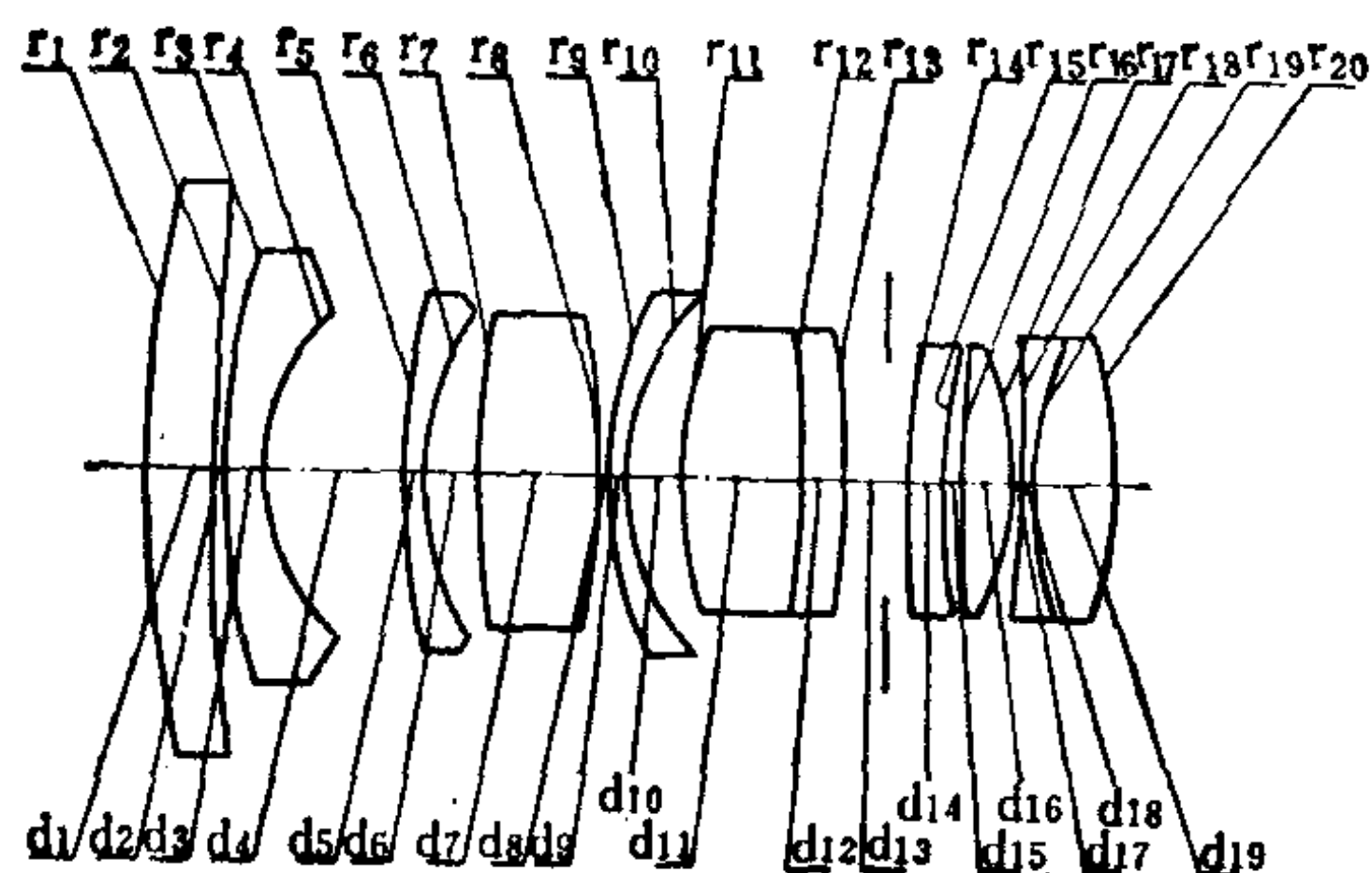
反远距型超广角物镜

E.F.L=1

B.F.L=1.737

FNo.=2.8

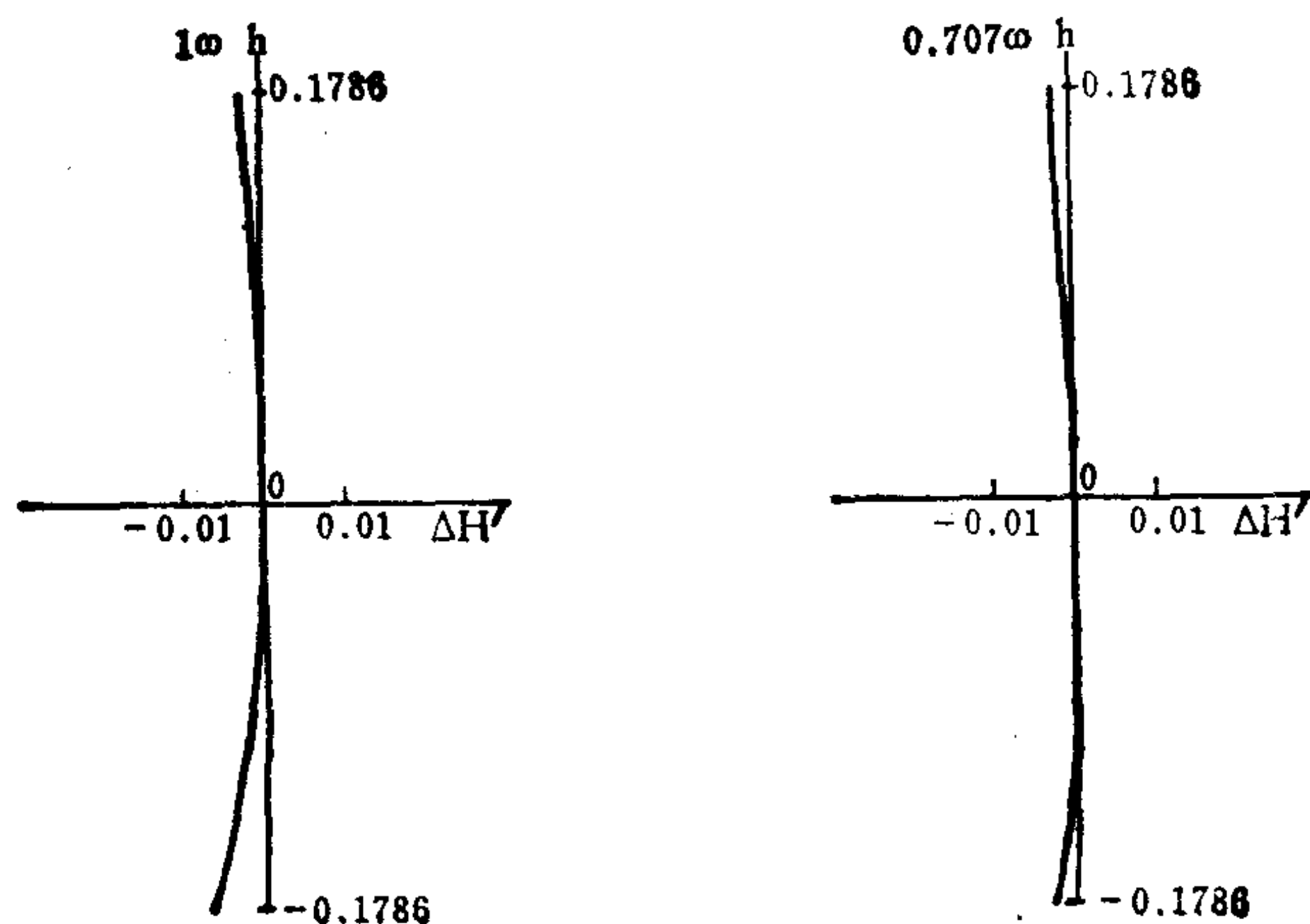
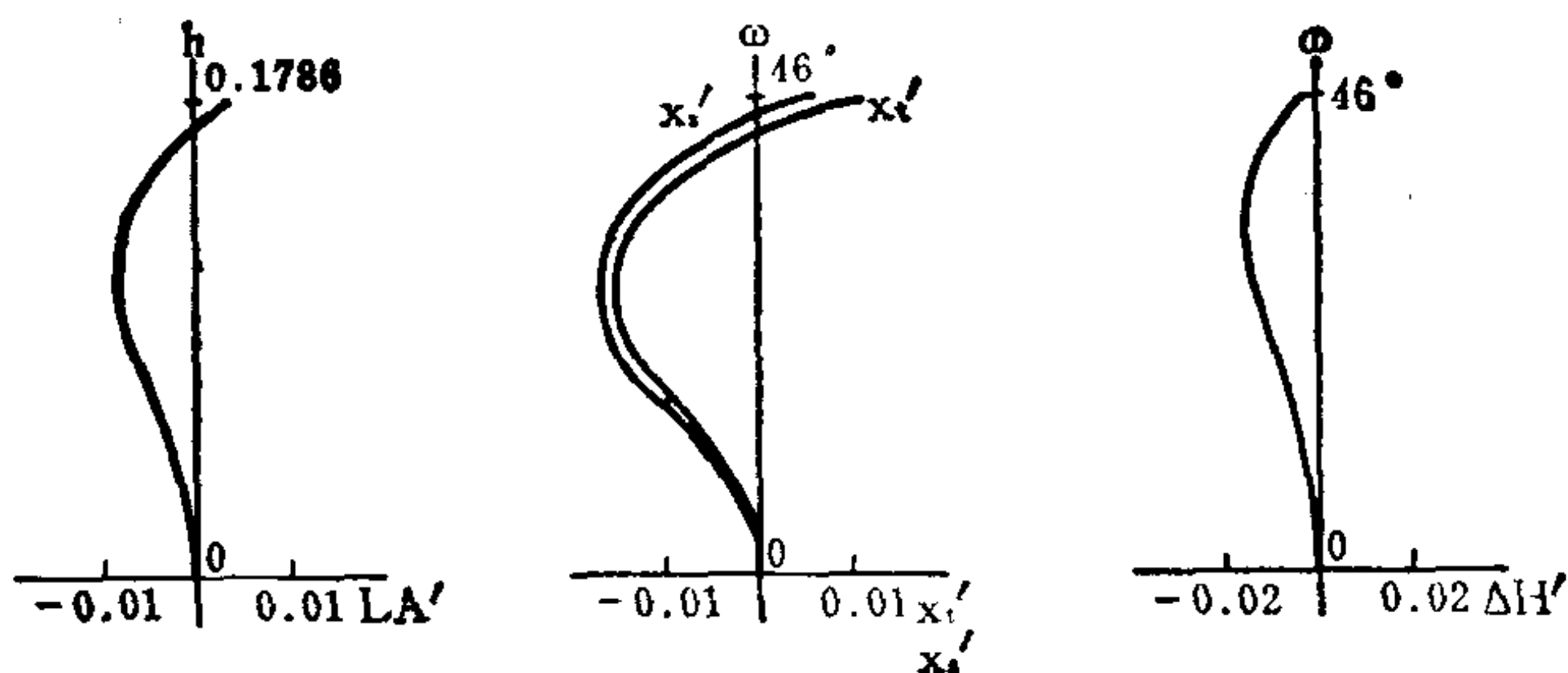
F.A.=±46°



序号	r	d	n	v	序号	r	d	n	v
1	2.9788	0.1850	1.69680	55.8	11	0.8793	0.3134	1.70030	47.7
2	9.1510	0.0039			12	-3.0738	0.1143	1.57250	57.5
3	1.6448	0.0818	1.61800	63.0	13	-2.2163	0.1552*		
4	0.5521	0.2531			14	30.7729	0.0678	1.80518	25.2
5	1.8573	0.0600	1.61800	63.0	15	1.2956	0.0569		
6	0.6791	0.1400			16	32.9072	0.1171	1.61800	63.0
7	18.8399	0.3053	1.75570	27.5	17	-0.9373	0.0039		
8	-4.6715	0.0050			18	-6.8533	0.0500	1.7650	46.3
9	1.0595	0.0633	1.78500	49.9	19	1.0961	0.2027	1.60311	60.9
10	0.6401	0.1039			20	-1.0057			

0.1552* = 0.0776 + 0.0776

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00208	0.00179	-0.00168	-0.00191	-0.01106	1	0.02%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{t1}	$K'_{t0.7}$
100	0.00457	0.00025	0.0117	0.0073	0.0044	-0.00366	-0.00188
70	-0.00799	-0.01642	-0.0143	-0.0166	0.0023	-0.00161	-0.00060



编号: 07-02-049

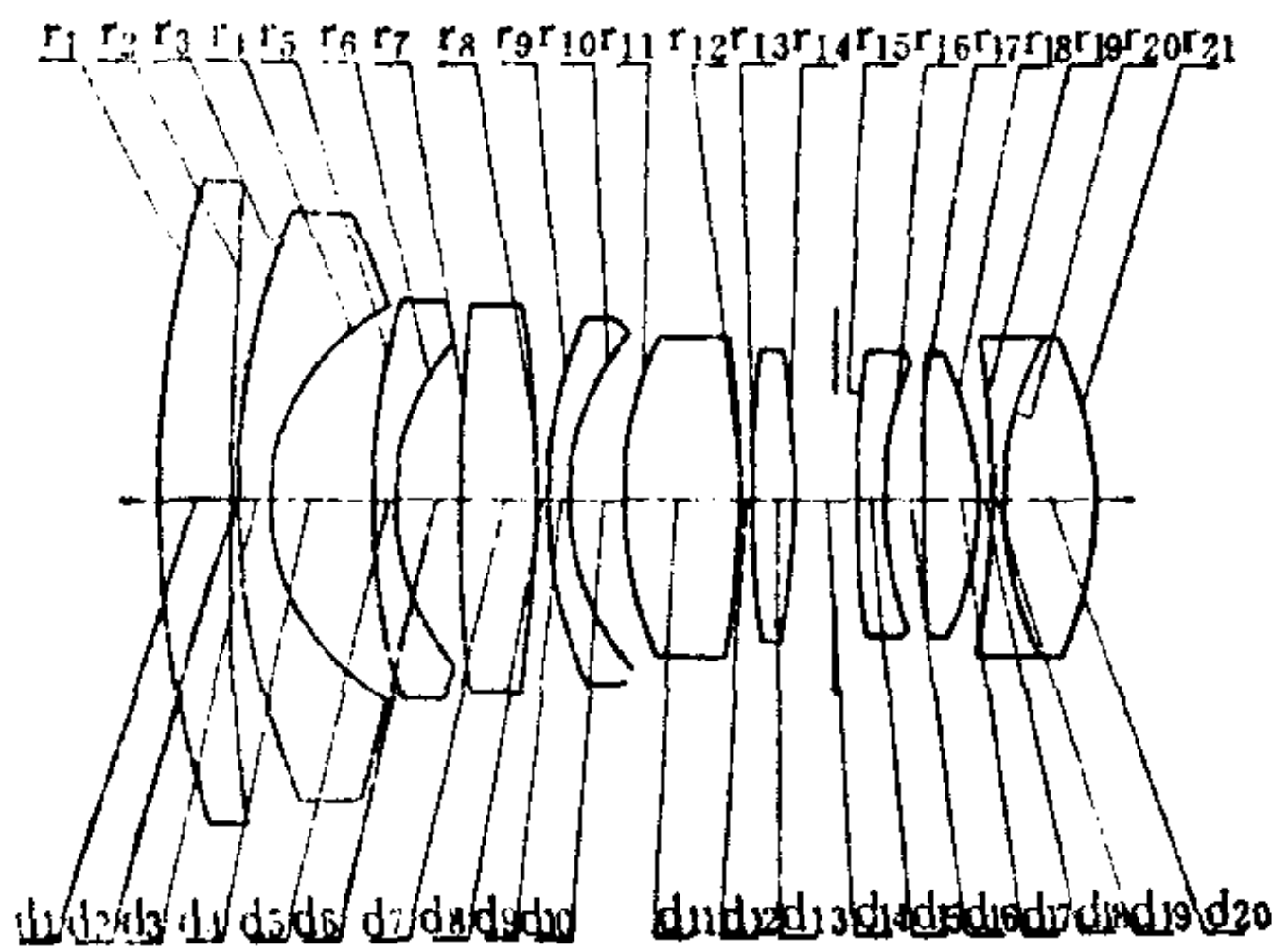
反远距型超广角物镜

E.F.L=1

B.F.L=1.75

FNo.=2.8

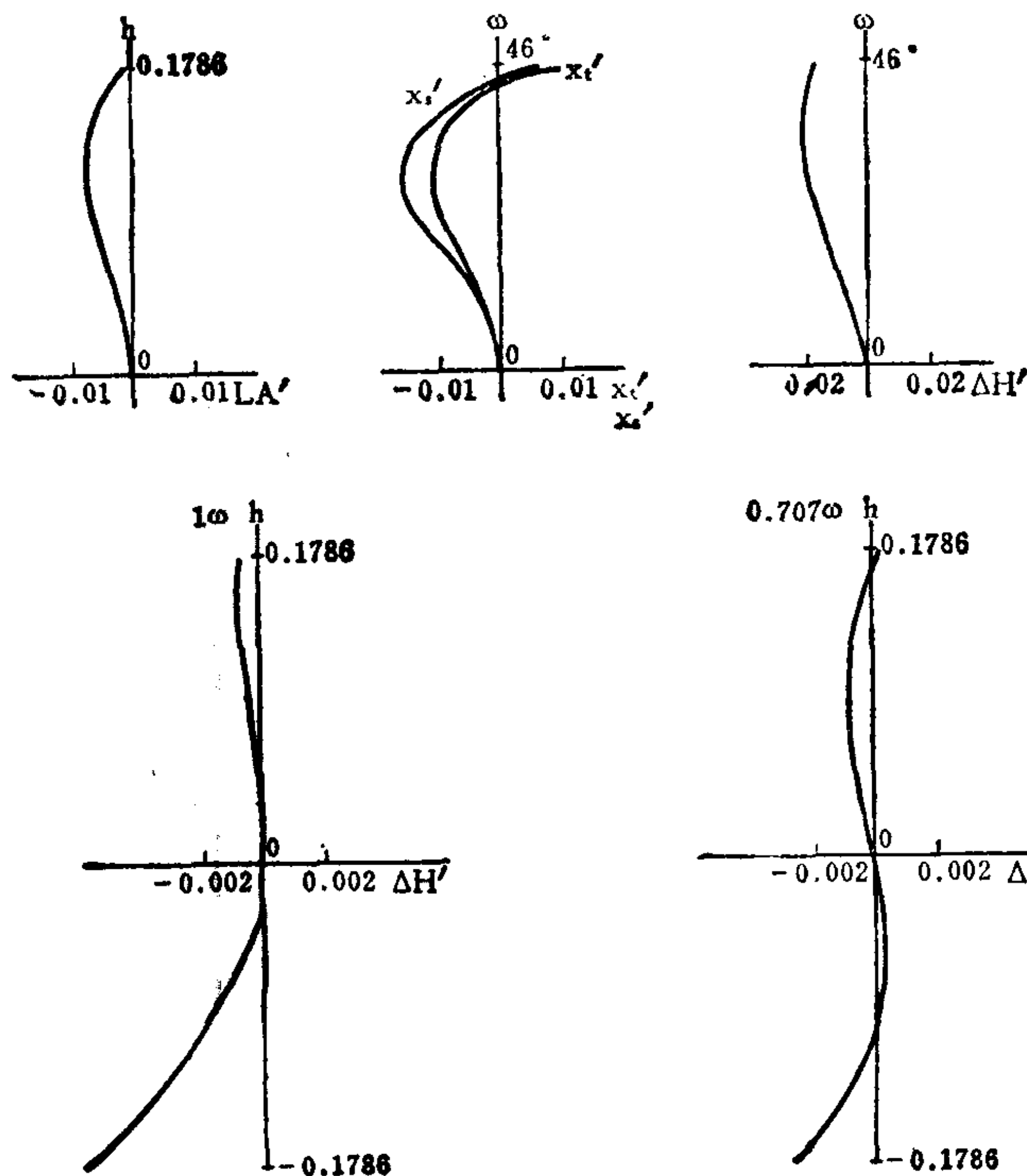
F.A.=±46°



序号	r	d	n	v	序号	r	d	n	v
1	2.9788	0.1850	1.69680	55.8	12	-12.0444	0.0200		
2	9.6129	0.0039			13	4.9086	0.1064	1.57250	57.5
3	1.7958	0.0818	1.61800	63.0	14	-2.5370	0.1535*		
4	0.5577	0.2531			15	7.7947	0.0679	1.80518	25.2
5	1.7907	0.0600	1.61762	52.7	16	1.2044	0.0807		
6	0.6315	0.1404			17	35.2347	0.1194	1.61800	63.0
7	19.2253	0.2017	1.76182	26.3	18	-0.8918	0.0039		
8	-5.3552	0.0050			19	-7.1170	0.0500	1.79950	42.5
9	1.1379	0.0633	1.77450	50.6	20	1.0228	0.2000	1.60311	60.9
10	0.6569	0.1039			21	-1.0394			
11	0.9120	0.2986	1.70154	41.1					

$$0.1535^* = 0.0776 + 0.0759$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00199	0.00122	-0.00083	-0.00193	-0.01409	1	-1.6%
h 或 ω %	LA'	$\Delta H'$	x_t'	x_s'	$x_t' - x_s'$	K'_{T1}	$K'_{T0.7}$
100	-0.00094	-0.01686	0.01138	0.00800	0.00338	-0.00327	-0.00177
70	-0.00786	-0.01969	-0.01140	-0.01567	0.00427	-0.00109	-0.00056



编号: 07-02-050

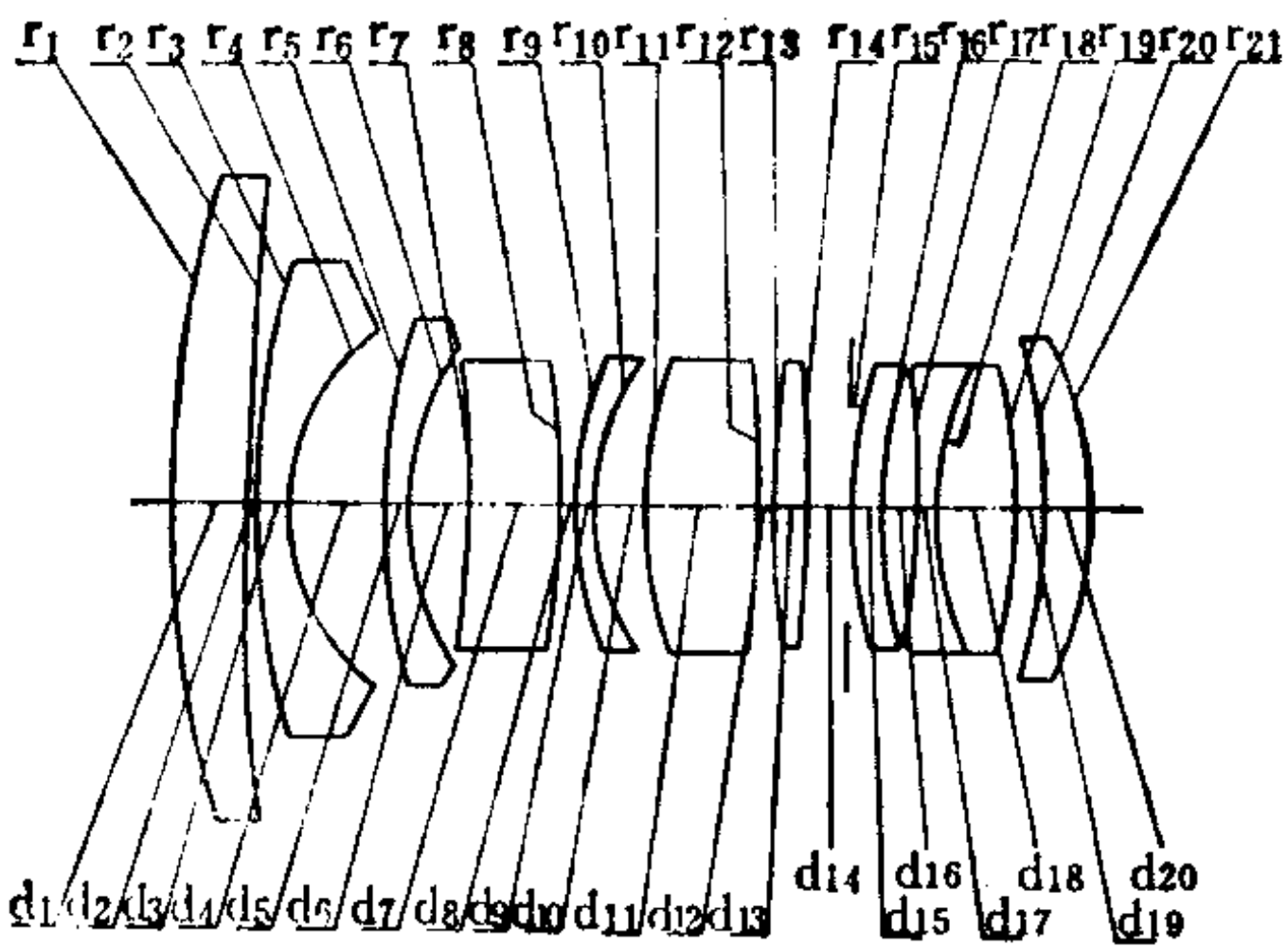
反远距型超广角物镜

E.F.L=1

B.F.L=1.746

FNo.=2.8

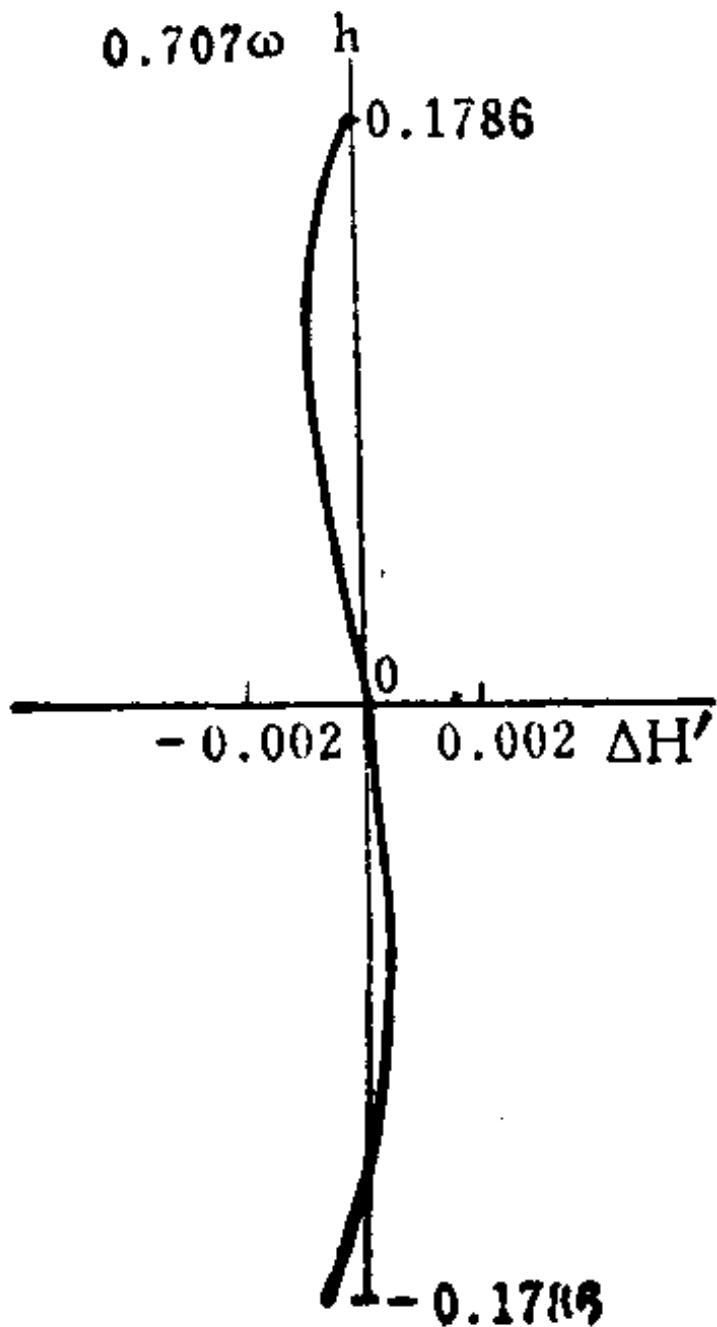
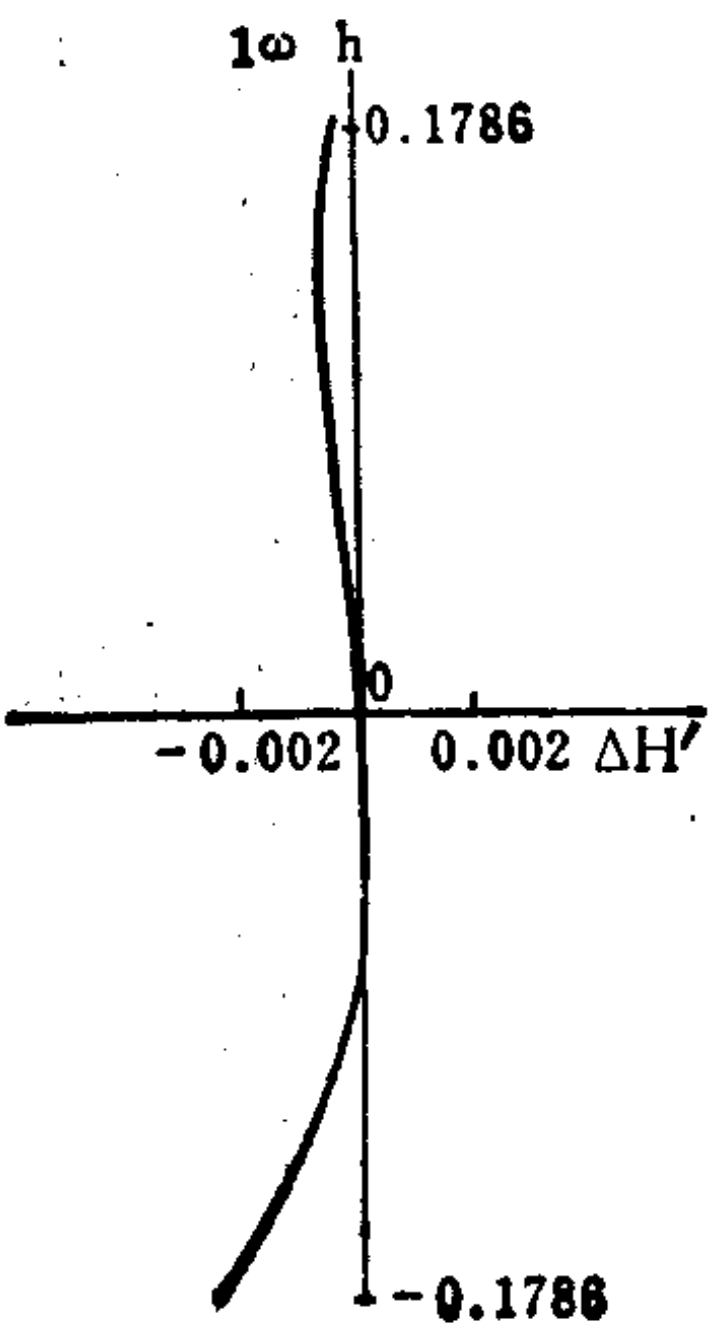
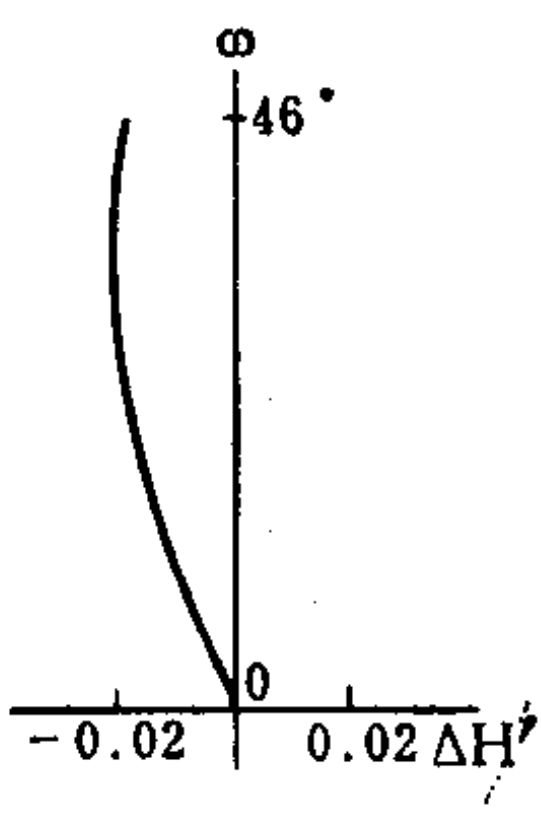
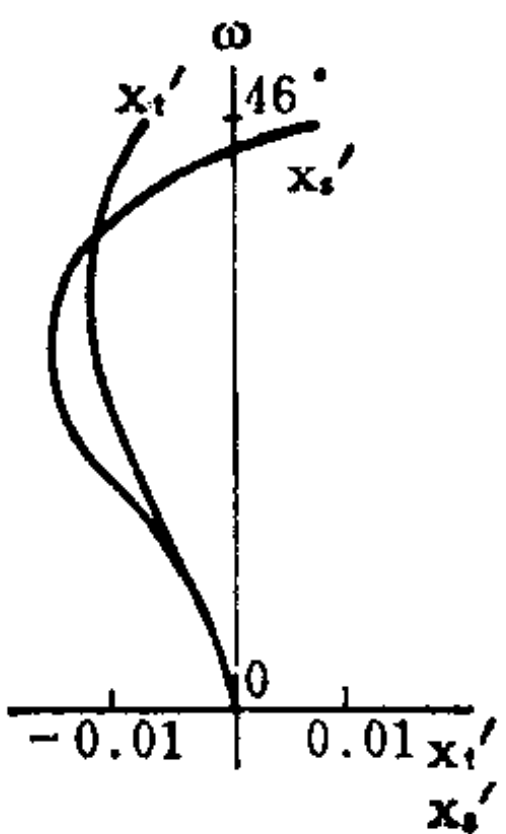
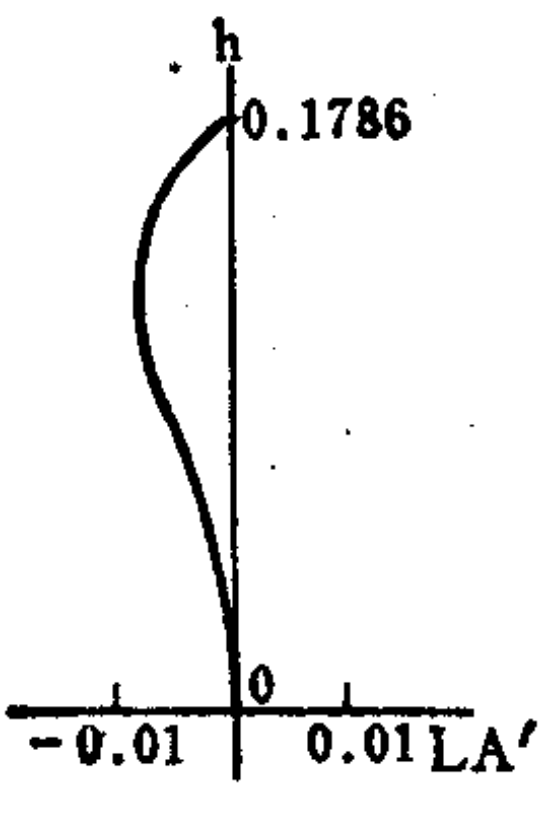
F.A.=±46°



序号	r	d	n	v	序号	r	d	n	v
1	2.9788	0.1850	1.69680	55.8	12	-41.6475	0.0200		
2	9.6126	0.0039			13	3.0291	0.0969	1.56873	63.2
3	1.7523	0.0818	1.61800	63.0	14	-8.2265	0.1324*		
4	0.5683	0.2531			15	2.6760	0.0662	1.80518	25.2
5	2.3818	0.0600	1.63854	55.7	16	1.2060	0.0807		
6	0.7262	0.1404			17	-9.2062	0.0500	1.80750	35.4
7	-325.4129	0.2378	1.76182	26.3	18	0.9022	0.2000	1.60311	60.9
8	-4.9327	0.0050			19	-1.0544	0.0039		
9	0.9649	0.0633	1.7745	50.6	20	-5.5427	0.1300	1.61800	63.0
10	0.6444	0.1039			21	-0.9747			
11	0.8746	0.2905	1.70154	41.1					

$0.1324^* = 0.0662 + 0.0662$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00185	0.00071	-0.00023	-0.00205	-0.01512	1	-1.9%
h 或 ω %	LA'	$\Delta H'$	x_t'	x_s'	$x_t' - x_s'$	K'_{T1}	$K'_{T0.7}$
100	-0.00092	-0.01993	-0.00805	0.00741	-0.01546	-0.00135	-0.00080
70	-0.00855	-0.02056	-0.01298	-0.01612	0.00314	-0.00041	-0.00042



编号: 07-02-051

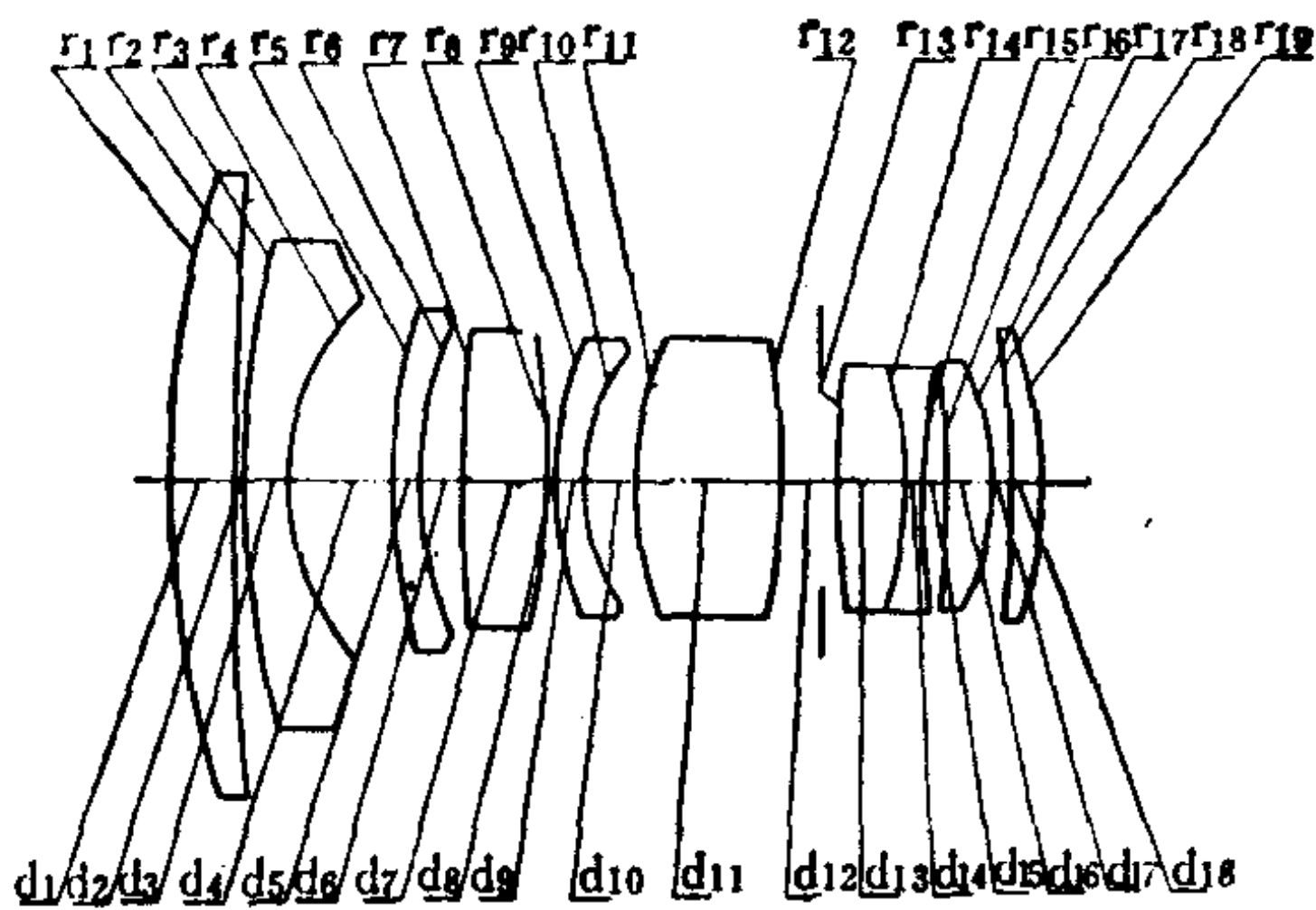
反远距型超广角物镜

E. F. L = 1

B. F. L = 1.76

FNo. = 2.8

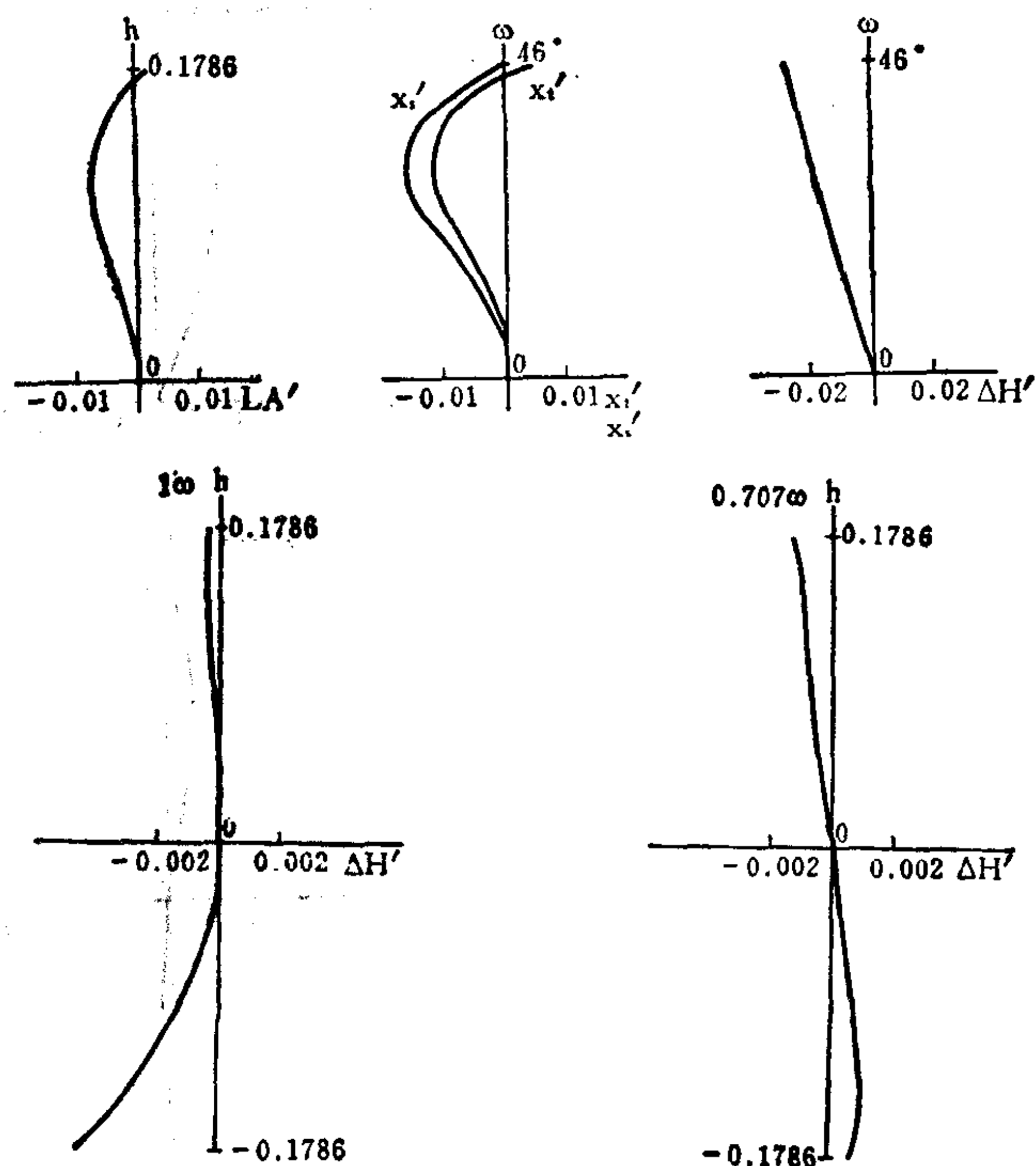
F. A. = $\pm 46^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	2.5552	0.1850	1.72000	52.5	11	0.8306	0.3912	1.66998	39.2
2	6.8380	0.0039			12	-2.5099	0.1465*		
3	2.0441	0.0976	1.63880	60.0	13	6.6187	0.1692	1.62004	36.3
4	0.5834	0.2844			14	-1.0407	0.0678	1.80518	25.2
5	1.8802	0.0600	1.60311	60.9	15	1.5955	0.0569		
6	0.8445	0.1088			16	-5.6633	0.1250	1.62135	61.3
7	55.6902	0.2317	1.68893	31.0	17	-0.7285	0.0039		
8	-5.8786	0.0050			18	-5.4685	0.0846	1.63880	60.0
9	1.1095	0.0633	1.74950	50.4	19	-1.3381			
10	0.5670	0.1137							

$$0.1465^* = 0.0735 + 0.0730$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00205	0.00134	-0.00075	-0.00207	-0.01442	1	-2.7%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.00286	-0.02803	0.00480	0.00061	0.00419	-0.00259	-0.00134
70	-0.00737	-0.02022	-0.01232	-0.01608	0.00376	-0.00036	-0.00002



编号: 07-02-052

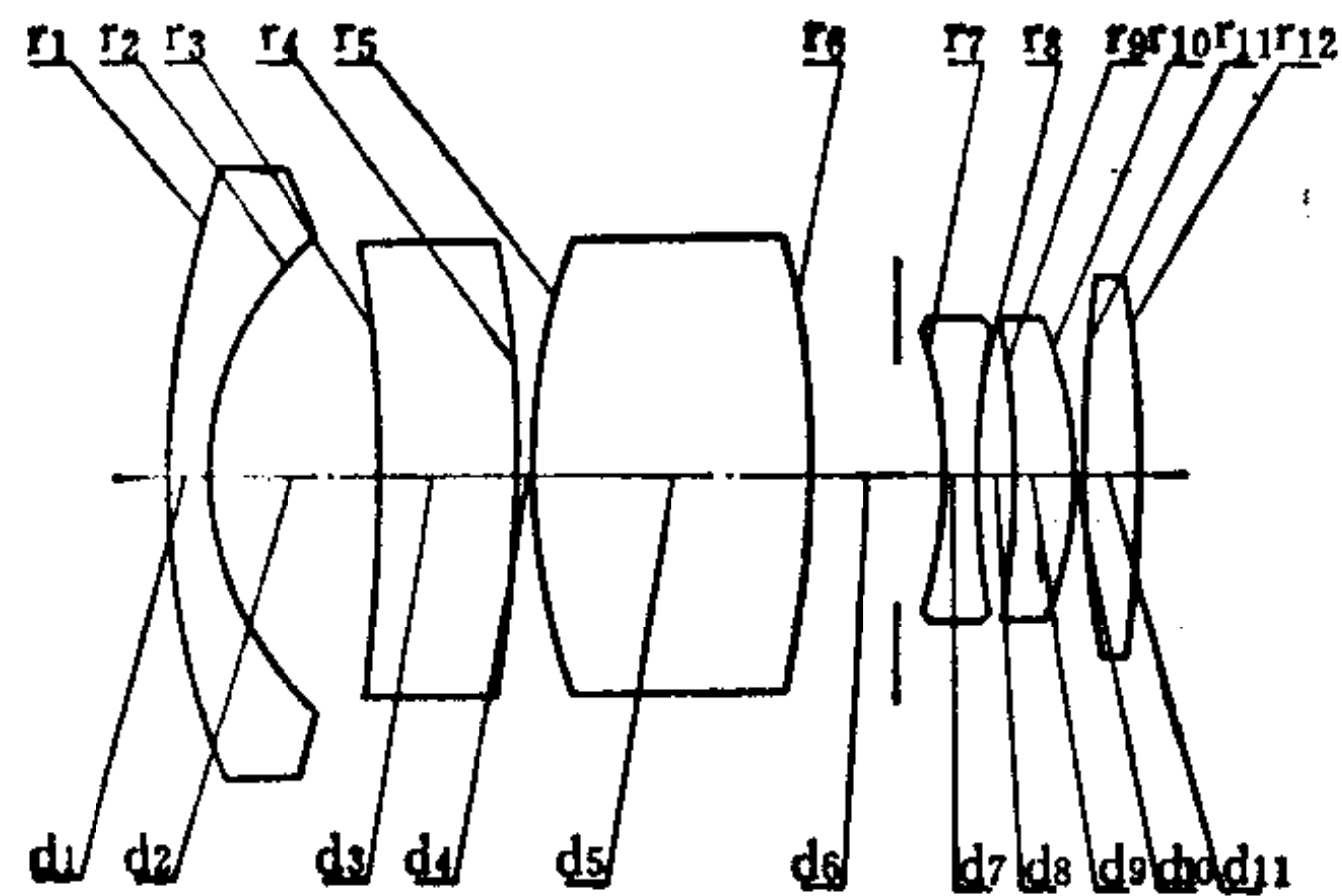
反远距型广角照相物镜

E. F. L = 100

B. F. L = 107.29

FNo. = 2.8

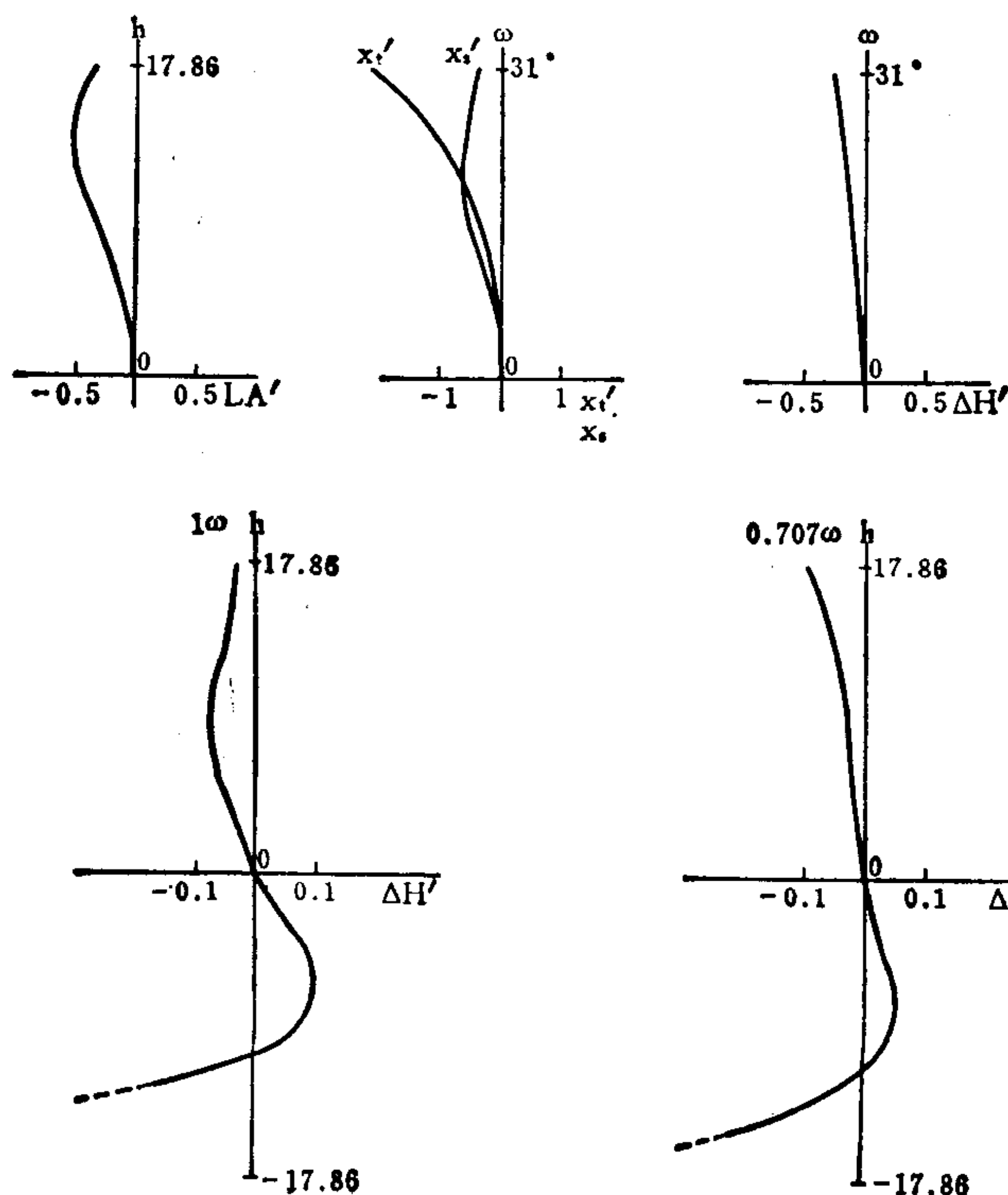
F. A. = $\pm 31^\circ$



序号	r	d	n	v_d	序号	r	d	n	v_d
1	133.333	5.556	1.51454	54.6	7	-59.028	4.167	1.71736	29.5
2	42.083	22.222			8	116.667	3.750		
3	-258.333	27.778	1.51680	64.2	9	-123.611	7.500	1.74443	49.4
4	-233.333	0.278			10	-49.167	0.278		
5	73.056	37.500	1.71300	53.9	11	277.778	6.944	1.62041	60.3
6	-133.889	17.222*			12	-188.669			

17.222* = 8.611 + 8.611

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.0891	0.0238	0.0129	-0.1184	-0.2210	60	-0.39%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.317	-0.235	-2.249	-0.366	-1.883	-0.8355	-0.1104
70	-0.486	-0.191	-0.771	-0.654	-0.117	-0.3861	-0.0490



编号: 07-02-053

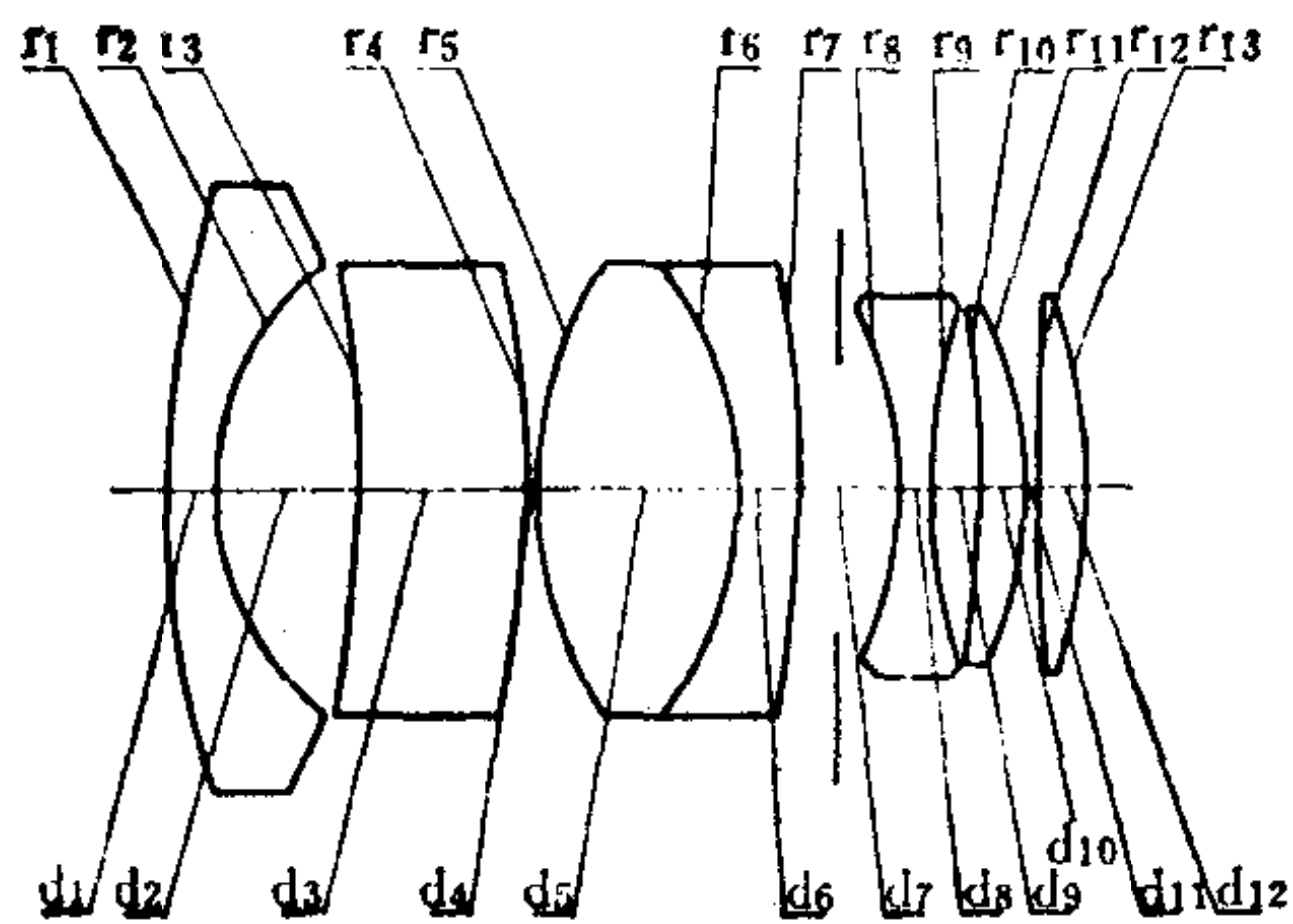
反远距型广角照相物镜

E. F. L = 100

B. F. L = 107.7

FNo. = 2

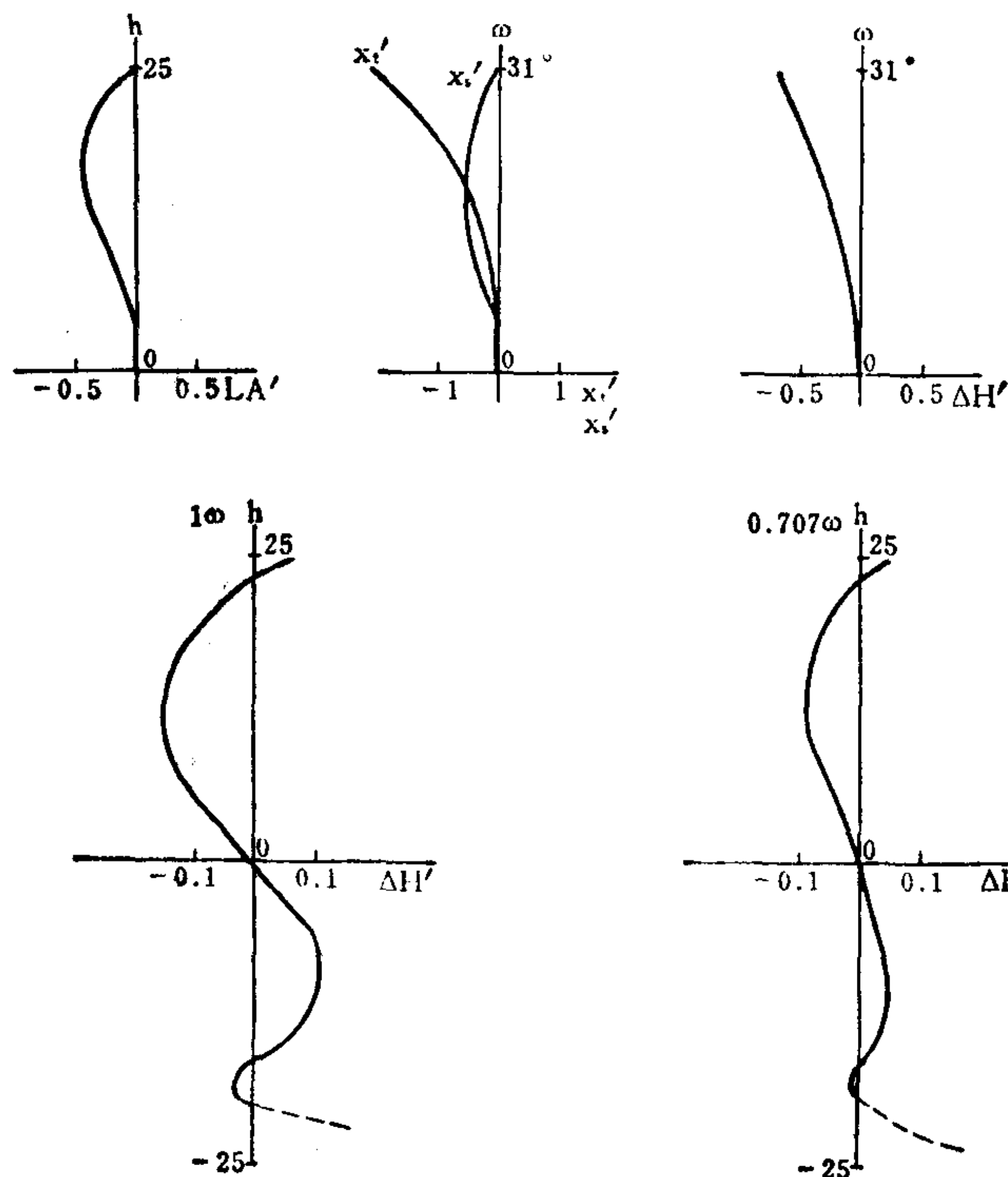
F. A. = $\pm 31^\circ$



序号	r	d	n	v_d	序号	r	d	n	v_d
1	186.111	8.333	1.51680	64.2	8	-65.694	5.000	1.71736	29.5
2	48.889	23.611			9	131.944	6.944		
3	-240.833	30.000	1.63854	55.5	10	-176.389	8.333	1.71300	53.9
4	-174.167	0.278			11	-61.111	0.278		
5	83.333	31.944	1.71300	53.9	12	472.222	7.778	1.62041	60.3
6	-61.111	12.222	1.62012	49.8	13	-111.708			
7	-283.333	18.056*							

$$18.056^* = 9.028 + 9.028$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1 ω)
	-0.2388	0.0224	0.0266	-0.2552	-0.4873	60	-1.1%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.015	-0.703	-2.241	-0.050	-2.191	1.4119	-0.0733
70	-0.464	-0.347	-0.797	-0.655	-0.142	0.7425	-0.0413



编号: 07-02-054

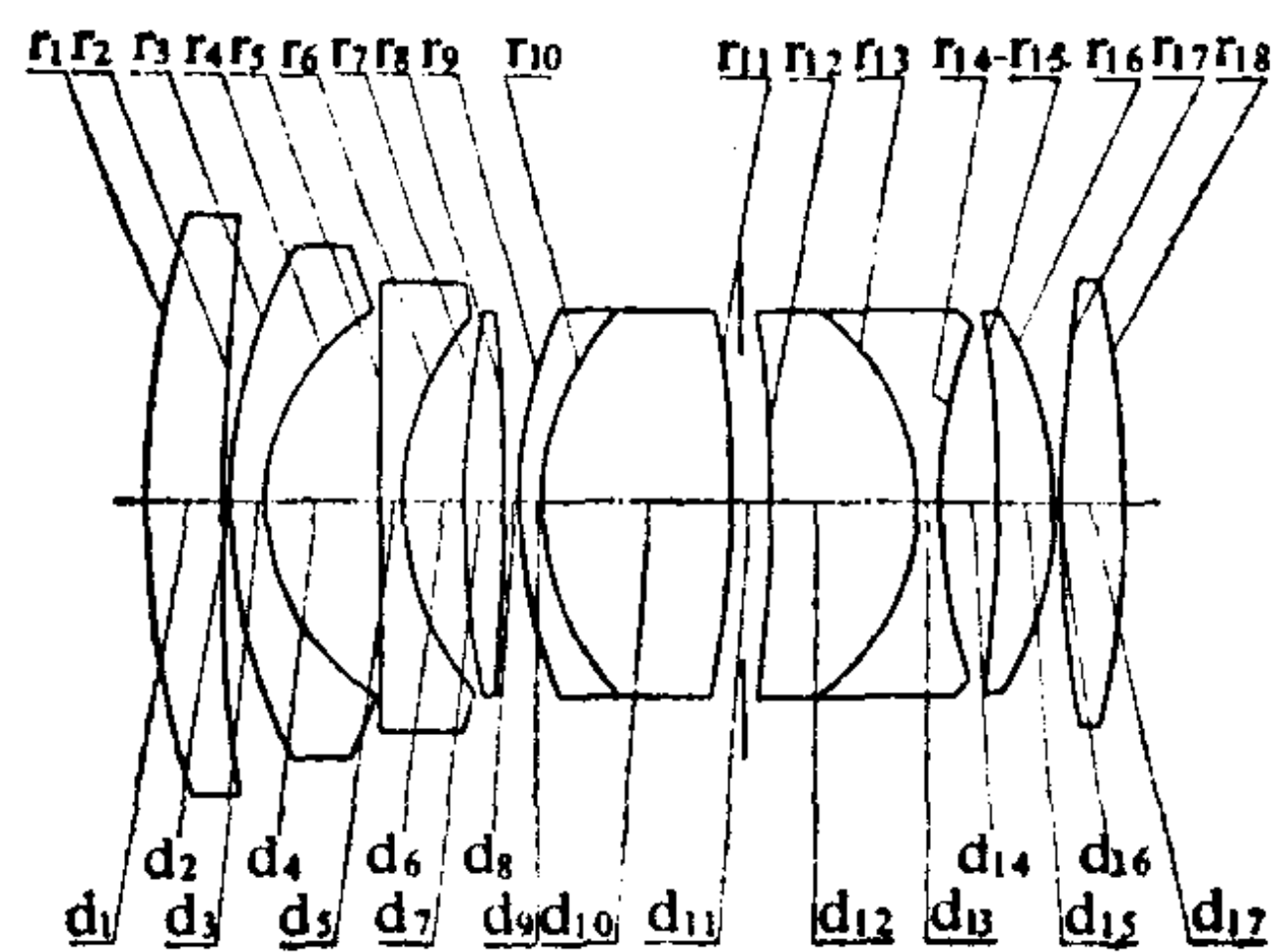
超广角大孔径照相物镜

E. F. L = 99.92

B. F. L = 155.09

FNo. = 2

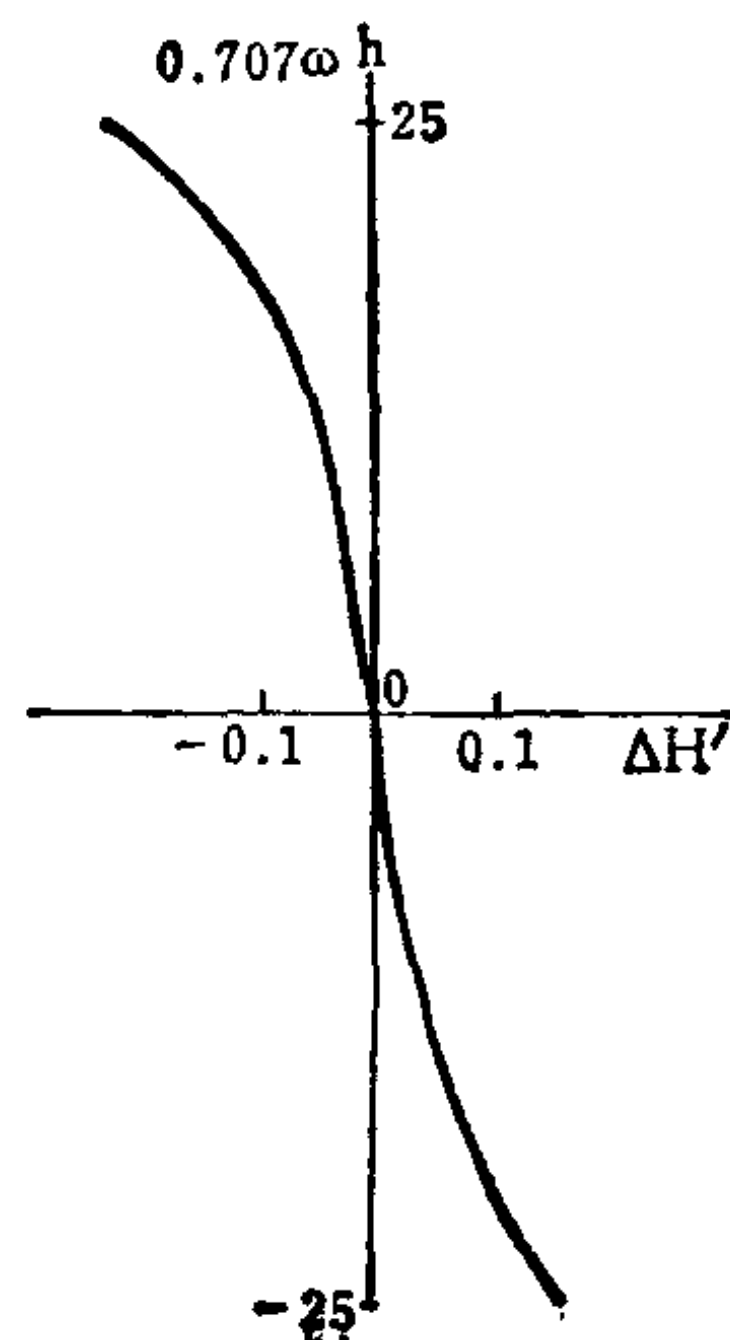
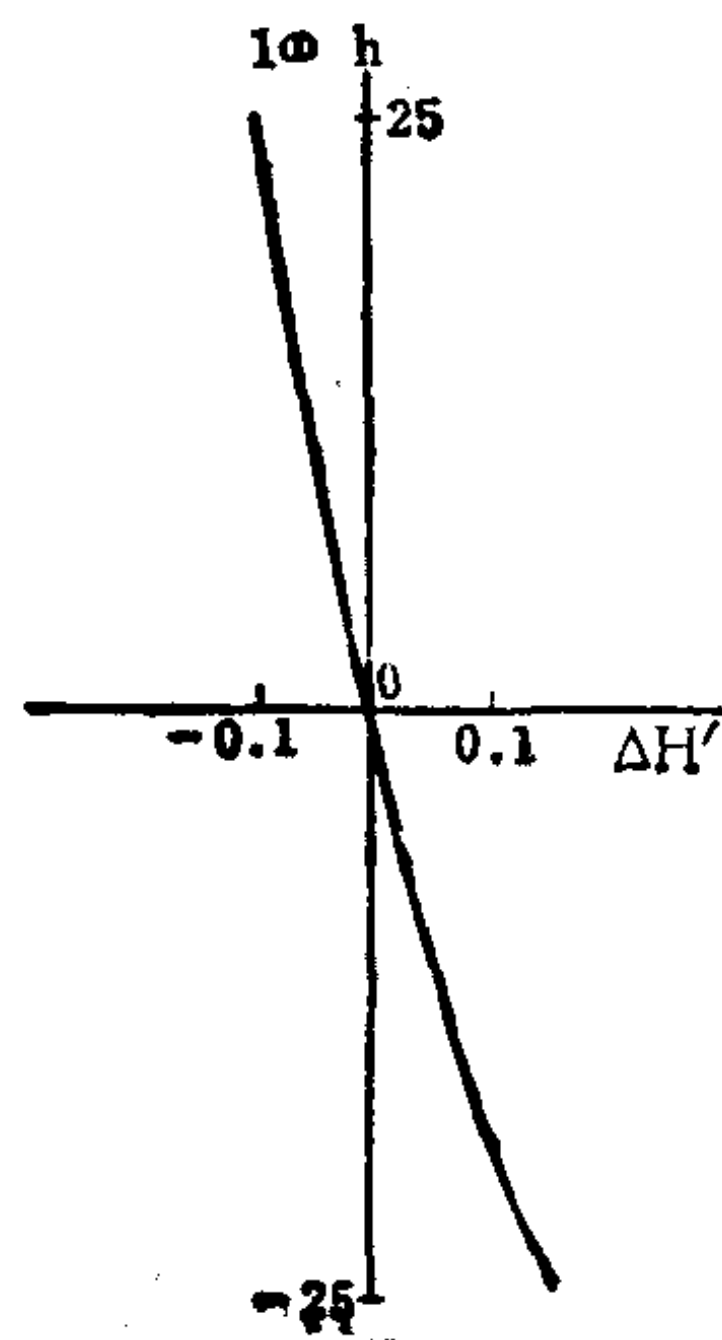
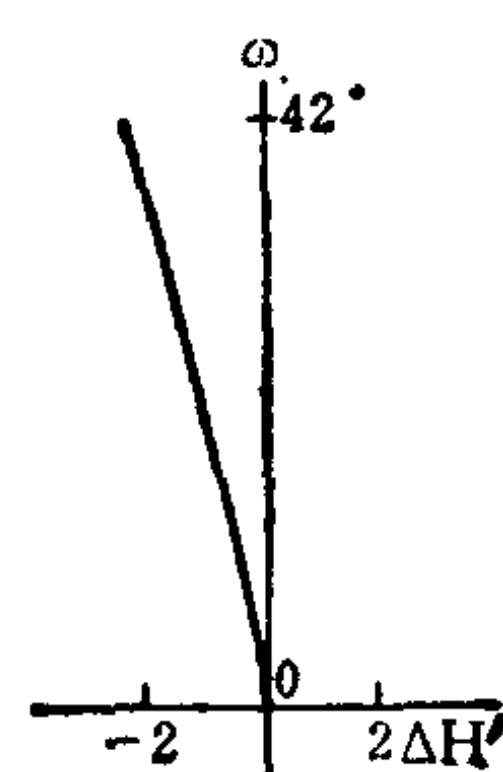
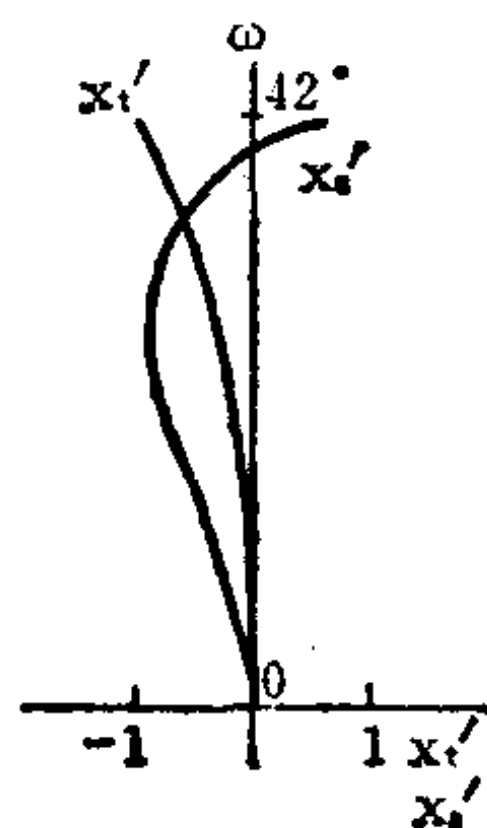
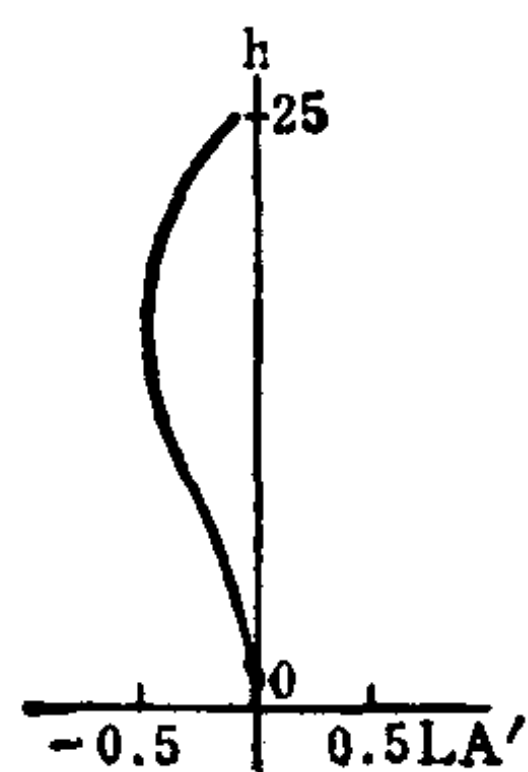
F. A. = $\pm 42^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	204.057	18.27	1.744	44.8	10	64.249	44.08	1.603	38.0
2	626.767	0.82			11	-316.204	10.61*		
3	138.494	7.35	1.603	60.7	12	-2779.380	32.24	1.773	49.7
4	52.127	26.12			13	-55.363	8.16	1.699	30.1
5	∞	6.12	1.603	60.7	14	175.571	12.25		
6	67.098	12.24			15	-246.812	12.25	1.697	55.6
7	233.682	9.80	1.516	56.8	16	-88.820	0.82		
8	-633.159	0.82			17	339.233	15.51	1.670	57.3
9	111.159	6.12	1.773	49.7	18	-239.616			

$$10.61^* = 5.30 + 5.31$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.2571	0.0389	0.1064	-0.3467	-1.7156	89.9	-2.4%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.162	-2.219	-1.018	0.573	-1.591	0.0317	0.0097
70	-0.508	-1.440	-0.364	-0.883	0.519	-0.0423	-0.0165



编号: 07-02-055

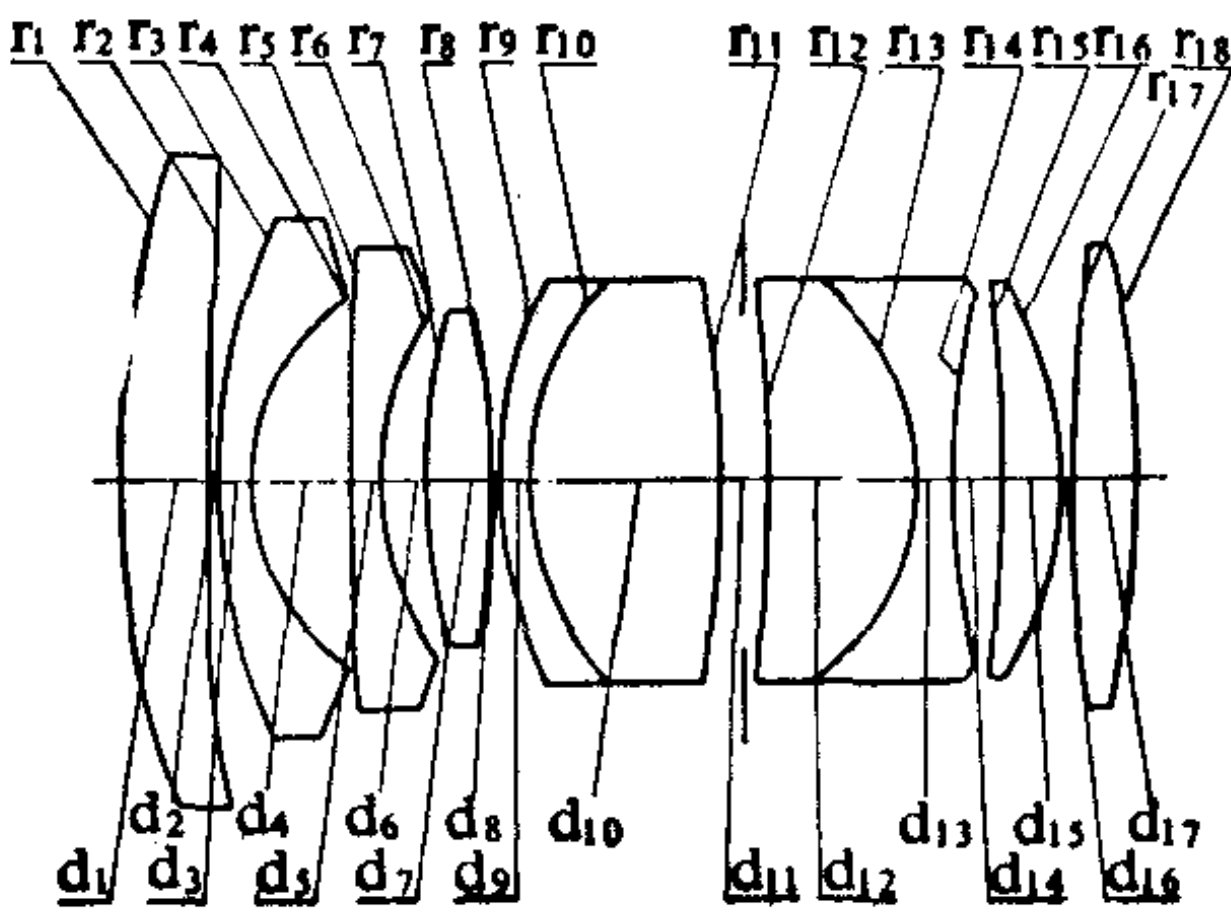
超广角大孔径照相物镜

E. F. L = 99.92

B. F. L = 155.05

FNo. = 2

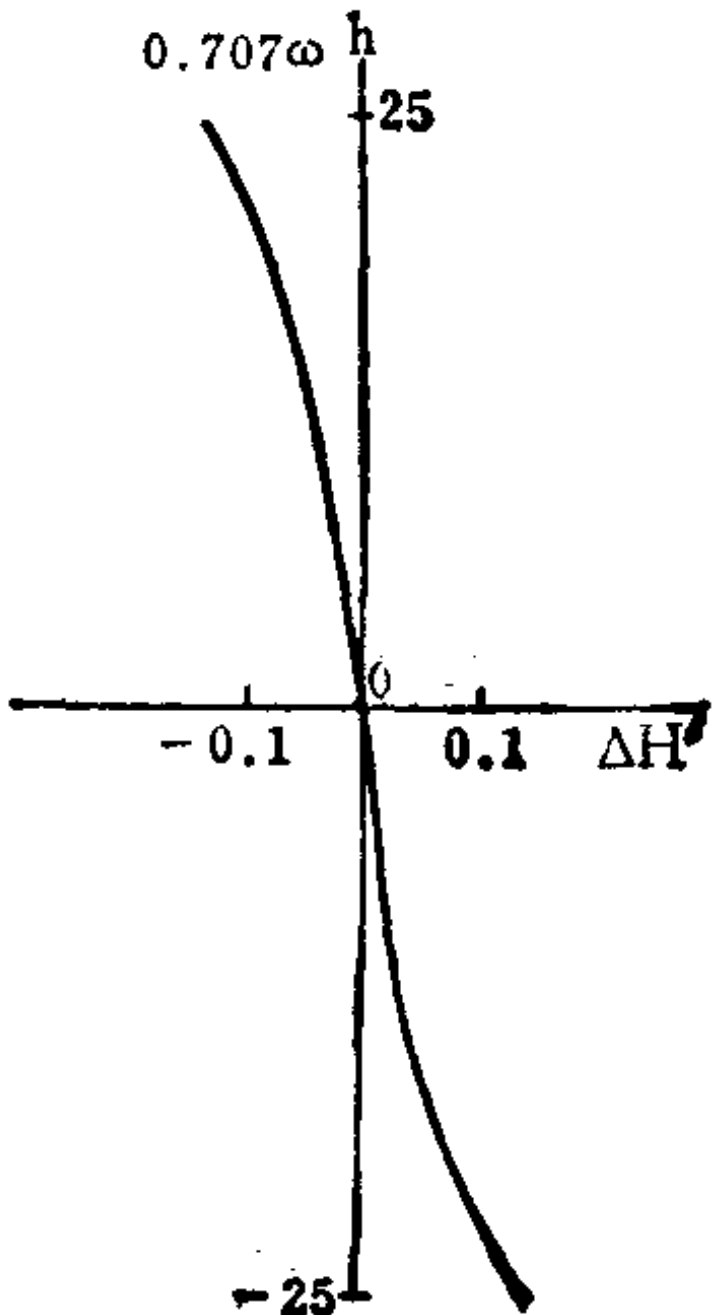
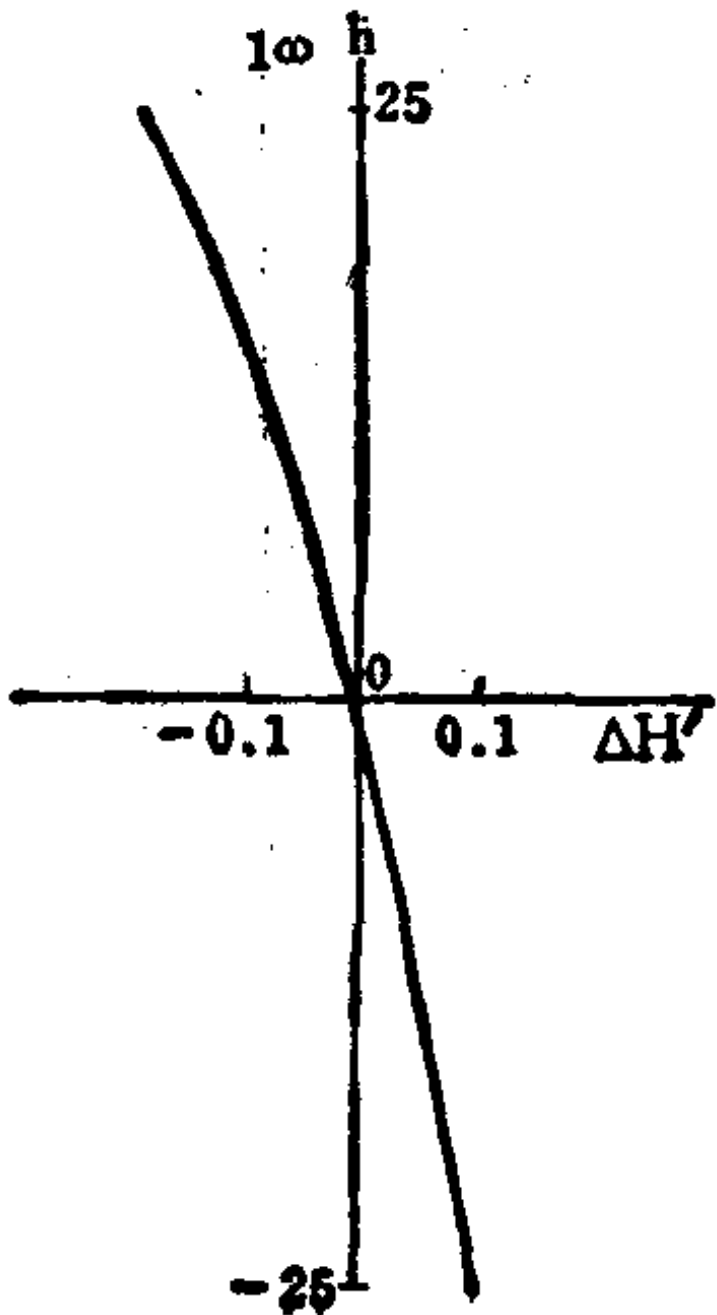
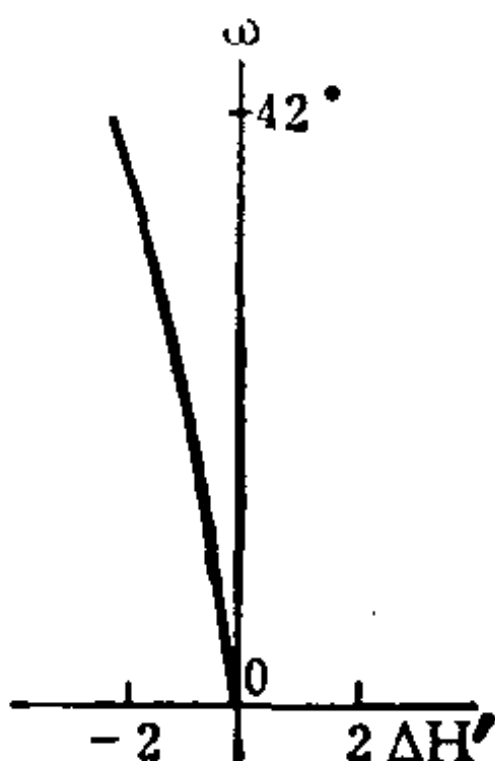
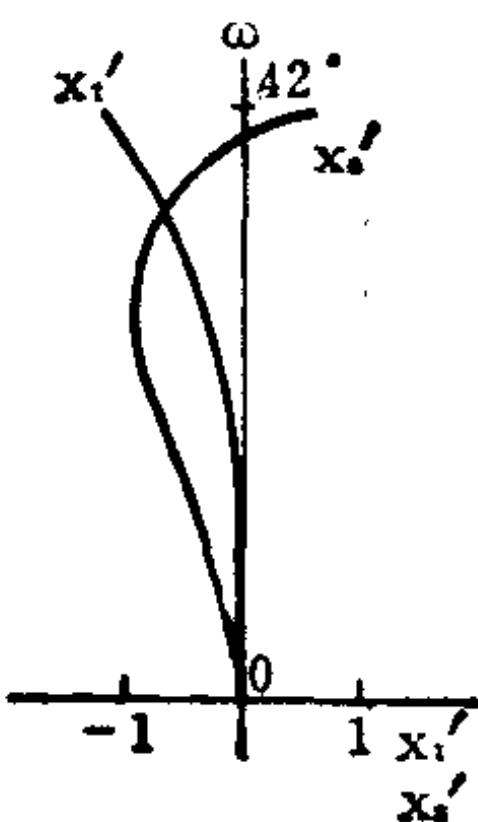
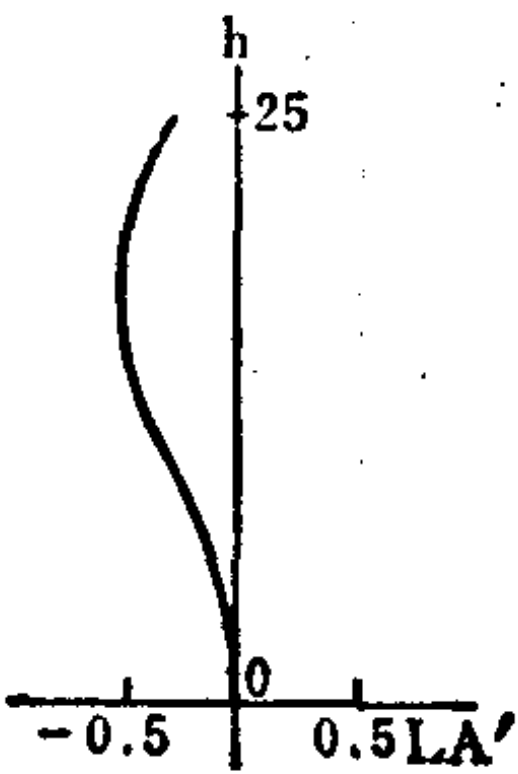
F. A. = $\pm 42^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	204.5330	20.41	1.762	40.2	10	67.1650	44.90	1.603	38.0
2	588.8364	0.82			11	-273.8570	10.20*		
3	142.0180	7.35	1.603	60.7	12	-581.7270	32.65	1.773	49.7
4	51.4660	23.67			13	-55.1050	8.16	1.699	30.1
5	1137.9470	6.12	1.603	60.7	14	193.1770	11.43		
6	68.3330	10.20			15	-285.1080	13.06	1.697	55.6
7	237.8820	14.29	1.518	58.9	16	-92.0580	0.82		
8	-803.8590	0.82			17	361.5230	15.51	1.697	55.6
9	112.0740	6.12	1.773	49.7	18	-233.8380			

$10.20^* = 5.10 + 5.10$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.2504	0.0658	0.0883	-0.3518	-1.7122	89.9	-2.4%
h 或 ω %	LA'	$\Delta H'$	x'_i	x'_s	$x'_i - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.299	-2.177	-1.236	0.647	-1.883	-0.0341	-0.0254
70	-0.537	-1.442	-0.325	-0.886	0.561	0.0066	-0.0040



编号: 07-02-056

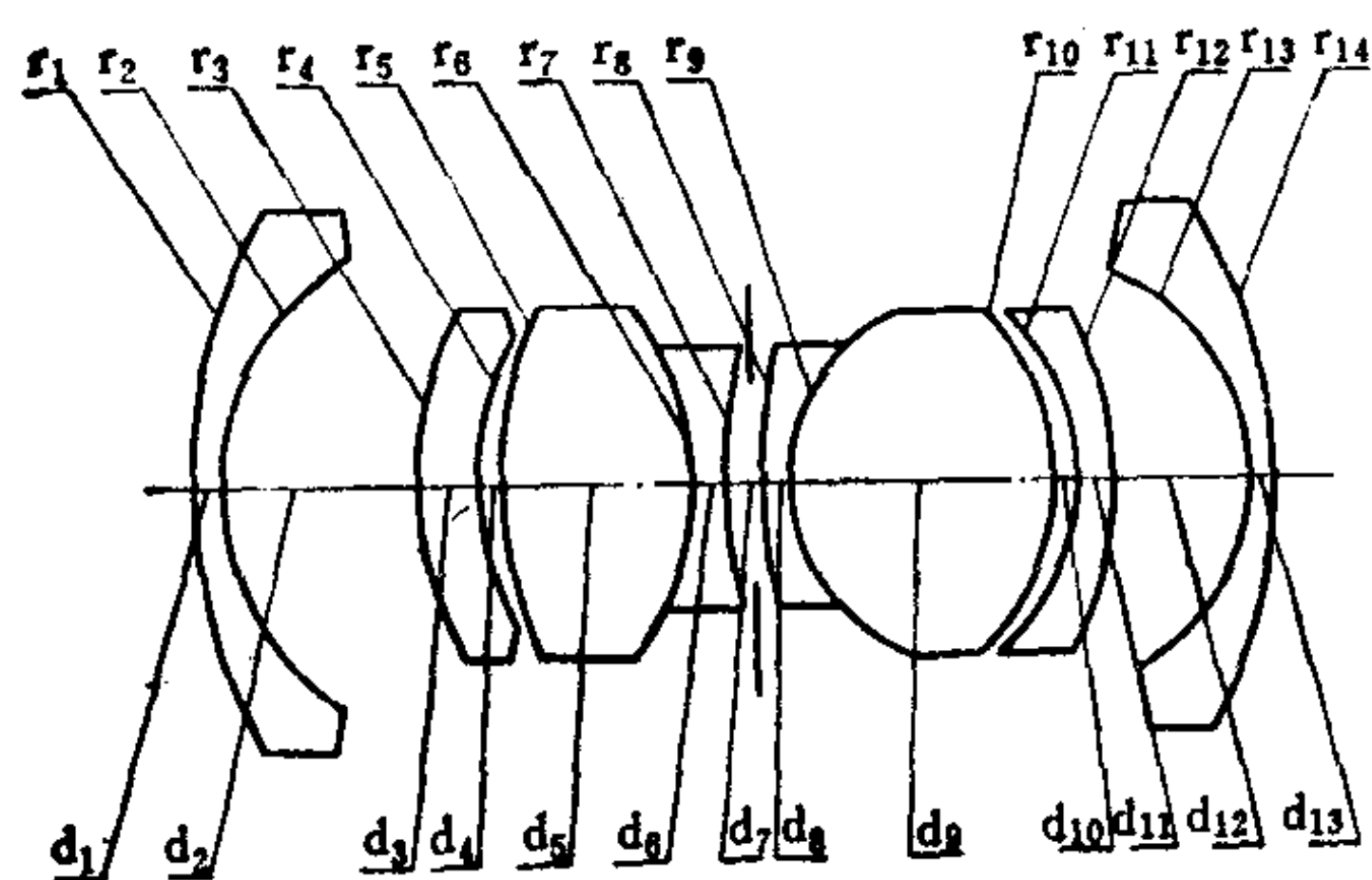
超 广 角 物 镜

E. F. L = 1

B. F. L = 0.699

FNo. = 5.6

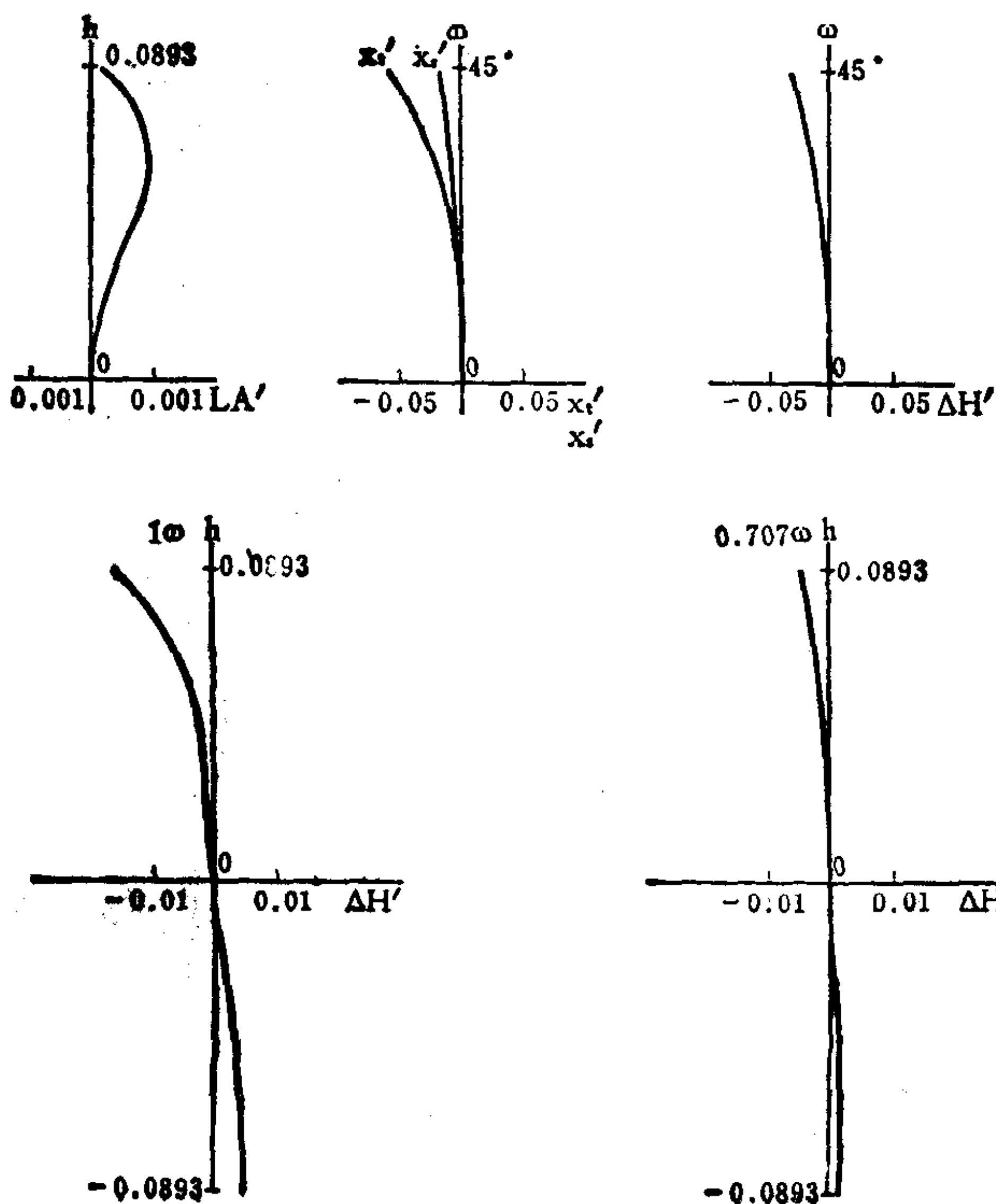
F. A. = $\pm 45^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	0.79288	0.04000	1.64250	58.1	8	11.62790	0.04000	1.52310	50.9
2	0.37861	0.27883			9	0.25999	0.38300	1.65160	58.5
3	0.61421	0.04600	1.56883	56.0	10	-0.36065	0.00940		
4	0.42827	0.02337			11	-0.32931	0.06500	1.72825	28.3
5	0.64523	0.28400	1.65844	50.8	12	-0.51539	0.17021		
6	-0.42074	0.04000	1.54814	45.9	13	-0.31487	0.04000	1.65844	50.8
7	4.08163	0.06500*			14	-0.70658			

$$0.06500^* = 0.03250 + 0.03250$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	0.000049	0.000037	-0.000188	0.000026	-0.002843	1	-2.9%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.000062	-0.02888	-0.05929	-0.01581	-0.04348	-0.00547	-0.00123
70	0.000952	-0.00877	-0.02233	-0.00743	-0.01490	-0.00119	-0.00005



编号: 07-02-057

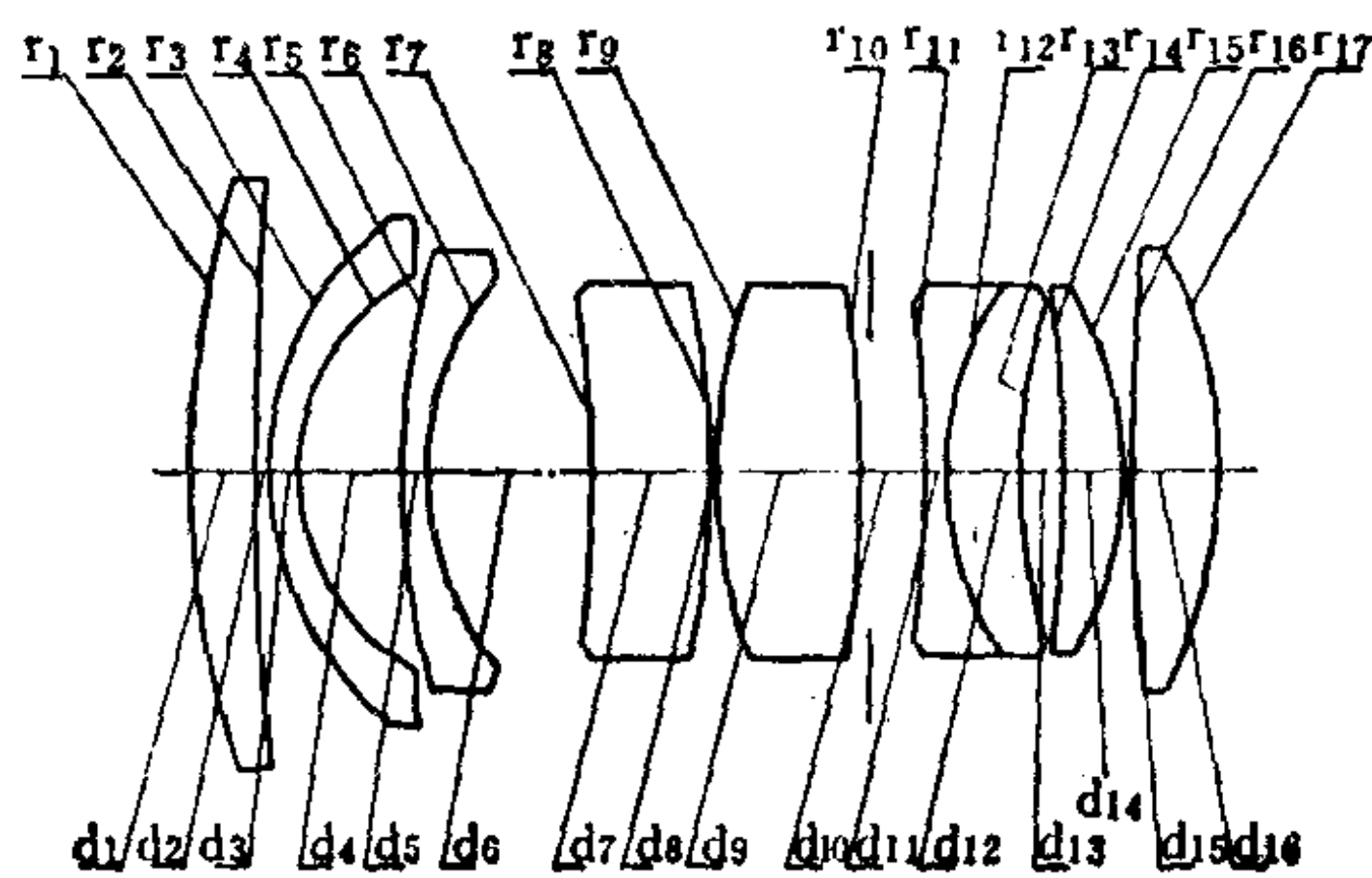
反远距型广角物镜

E. F. L = 1

B. F. L = 1.560

FNo. = 2.8

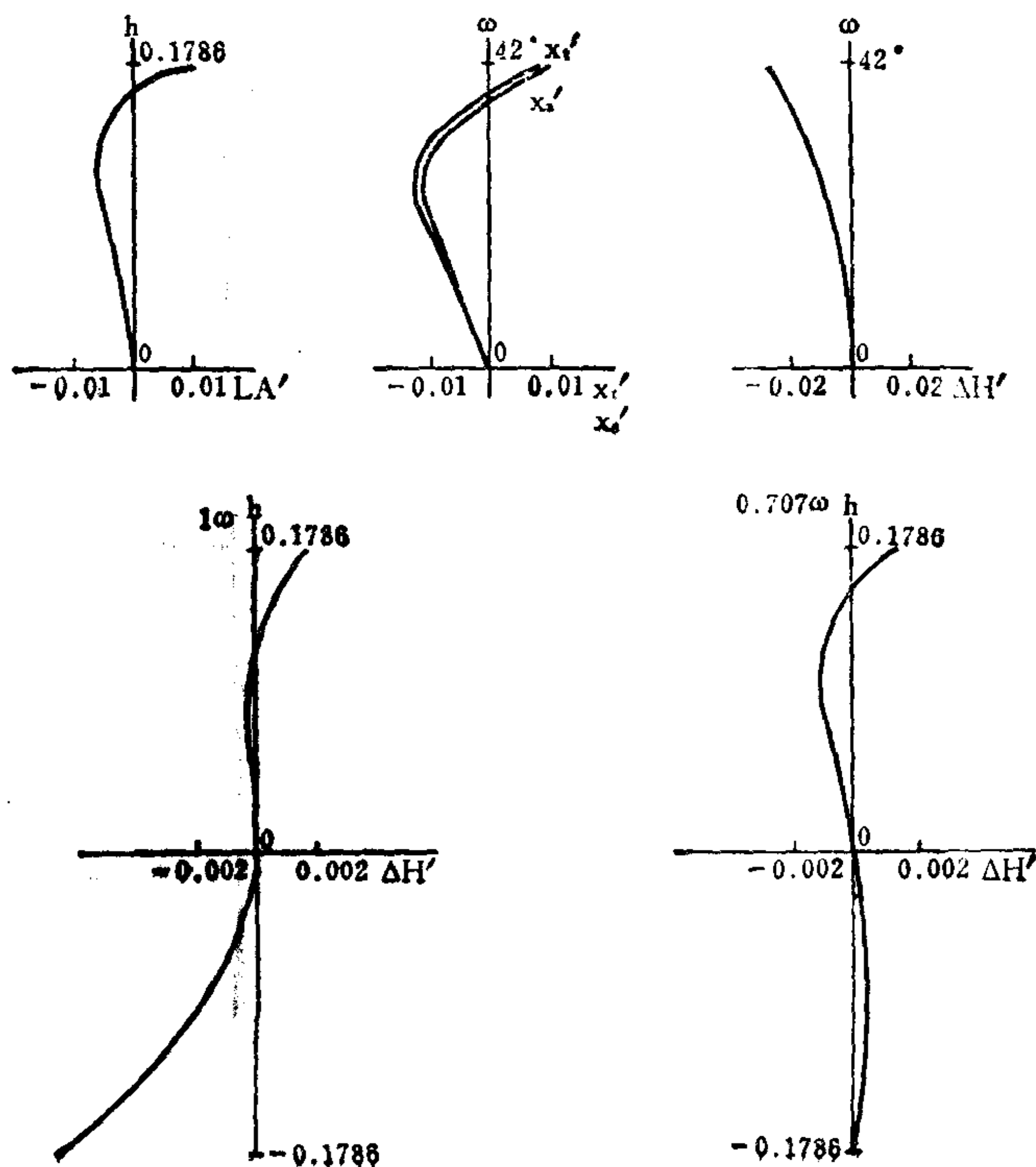
F. A. = $\pm 42^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	1.53019	0.12	1.60717	40.2	10	-4.52667	0.11*		
2	3.40700	0.01			11	-1.96067	0.05	1.76182	26.5
3	0.55556	0.05	1.69350	53.4	12	0.66973	0.12	1.77252	49.6
4	0.37037	0.18			13	1.60718	0.06		
5	1.35156	0.04	1.69350	53.4	14	-1.92023	0.10	1.62041	60.3
6	0.49290	0.16			15	-0.65381	0.01		
7	-3.33333	0.20	1.64769	33.9	16	8.31732	0.14	1.51633	64.0
8	-2.00000	0.01			17	-0.80738			
9	1.19210	0.24	1.72825	28.3					

0.11* = 0.04 + 0.07

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.001546	0.000517	-0.000090	-0.001815	-0.009823	0.9	-3%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.0115	-0.0270	0.0083	0.0091	-0.0008	-0.00251	-0.00165
70	-0.0056	-0.0127	-0.0121	-0.0115	-0.0006	0.00084	-0.00026



编号: 07-02-058

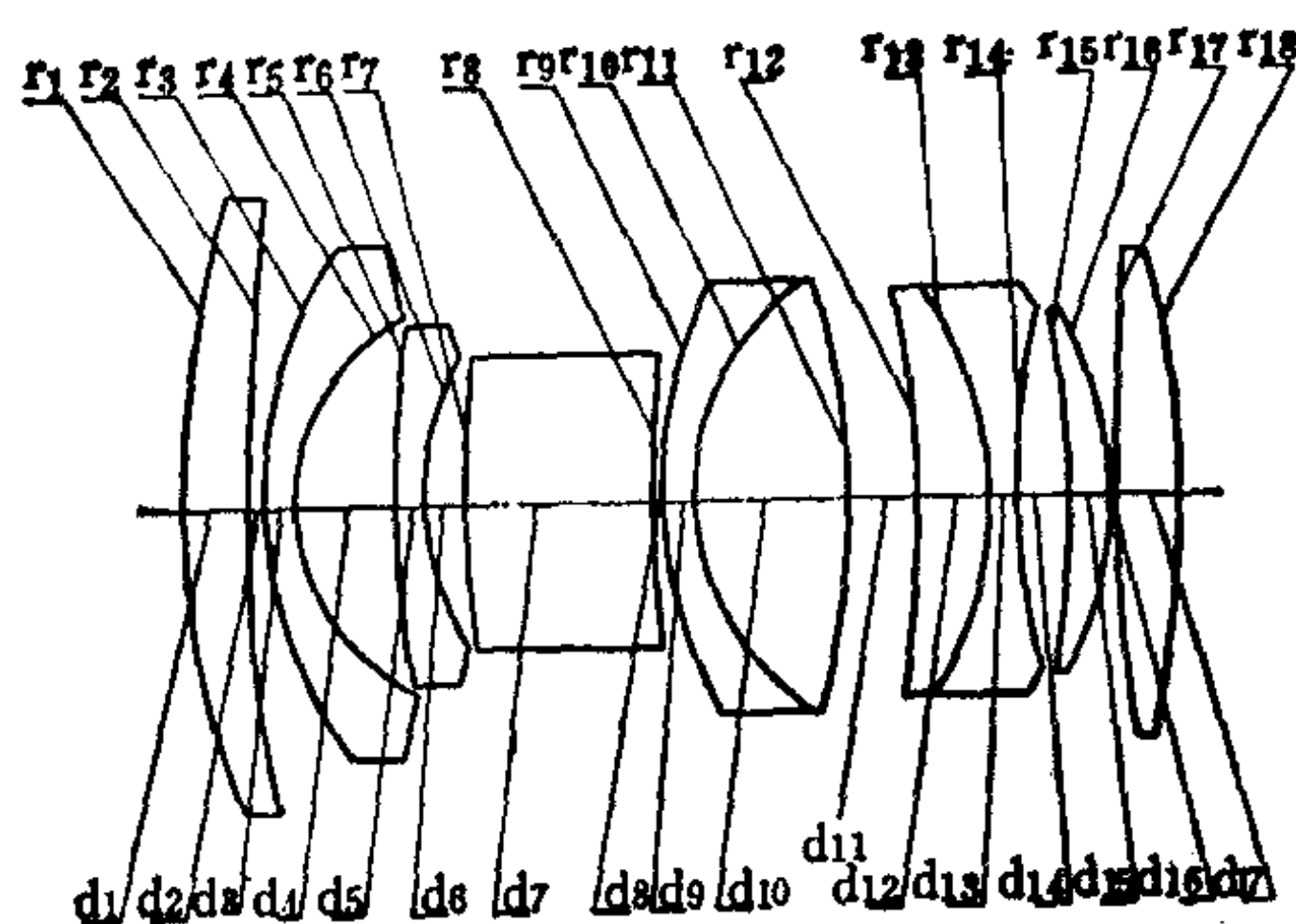
超广角大孔径照相物镜

E. F. L = 1

B. F. L = 1.7522

FNo. = 2

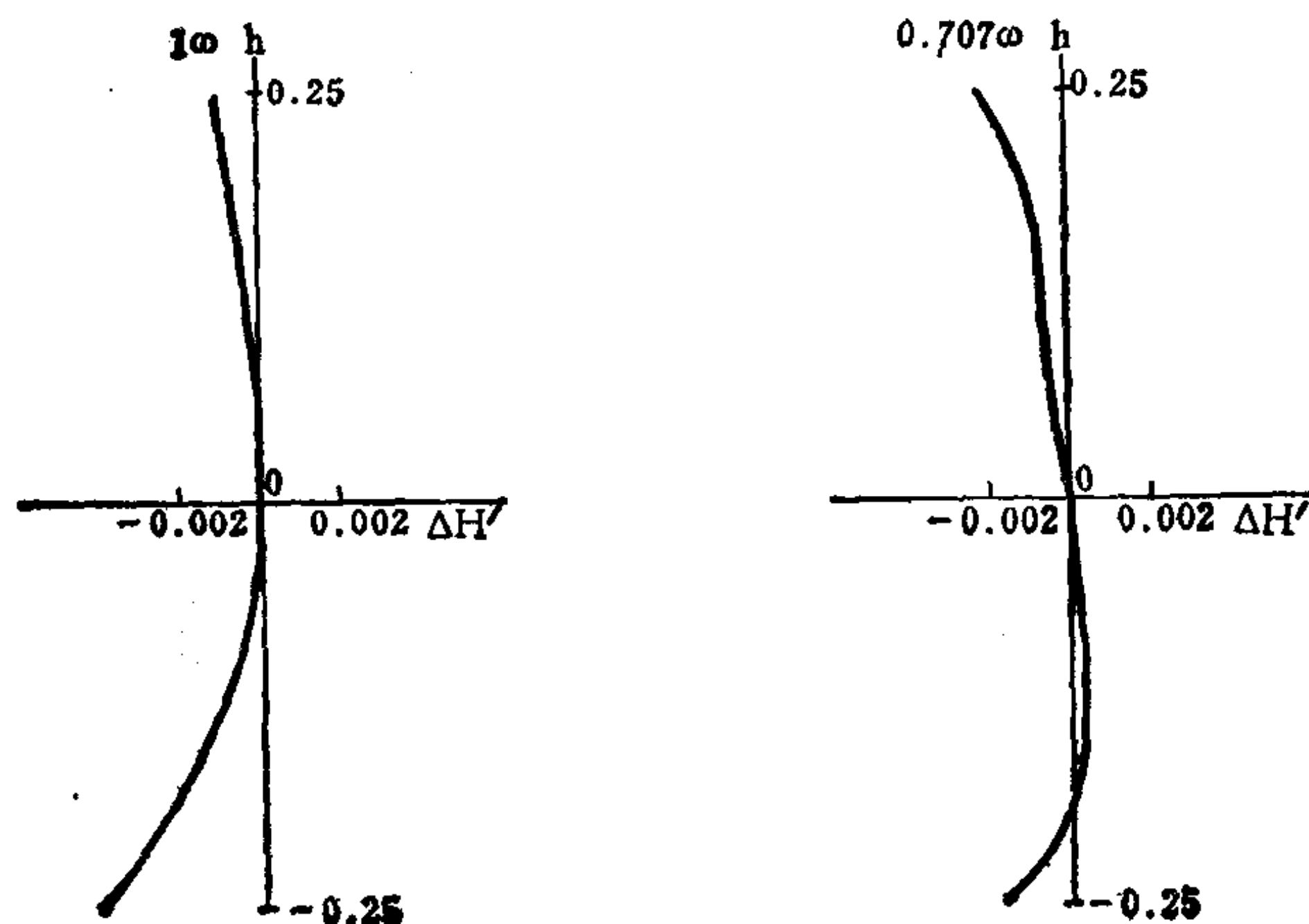
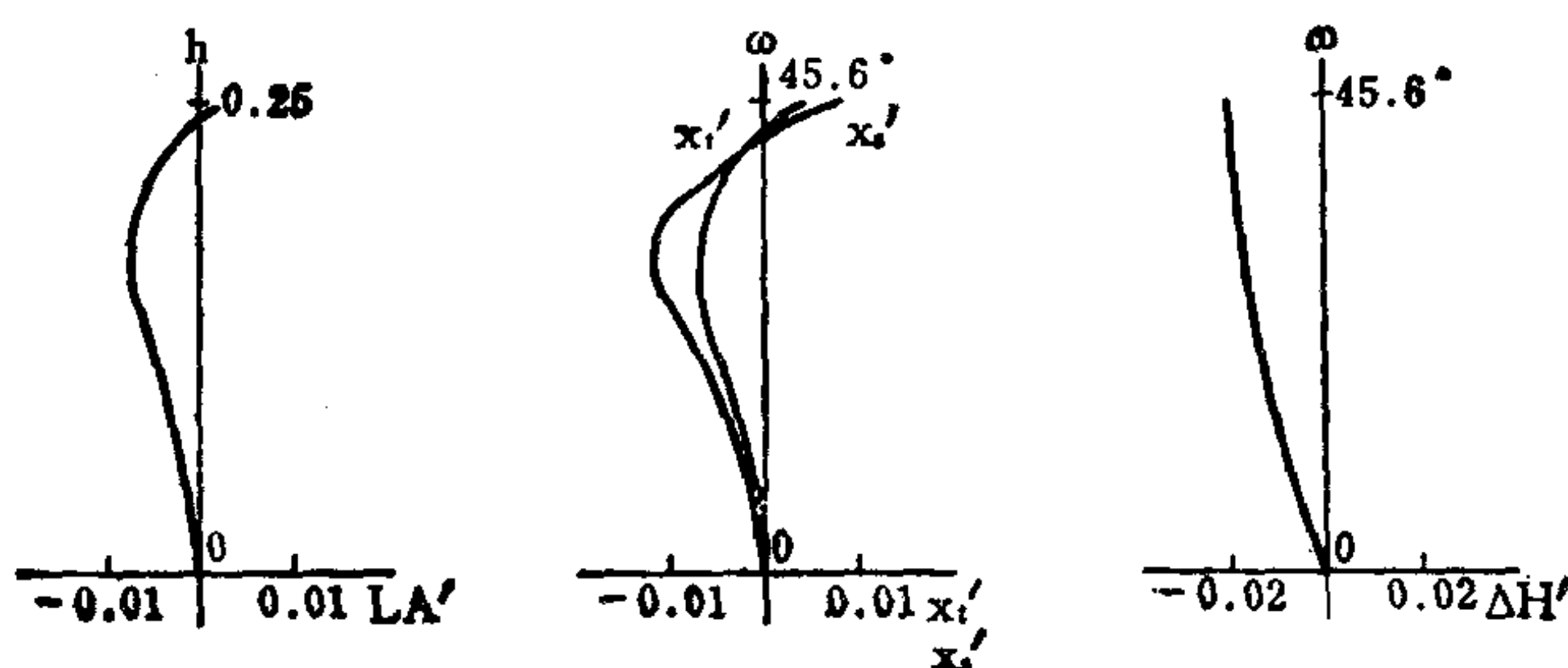
F. A. = $\pm 45.6^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	2.3797	0.1858	1.72000	43.7	10	0.6760	0.3864	1.59340	34.8
2	6.0515	0.0060			11	-2.0937	0.1644*		
3	1.0602	0.0697	1.72000	50.3	12	-18.7474	0.1760	1.75700	47.9
4	0.5380	0.2313			13	-0.9208	0.0697	1.80518	25.4
5	2.5597	0.0650	1.75700	47.9	14	2.0162	0.1092		
6	0.6420	0.0975			15	-3.0293	0.1301	1.69680	55.6
7	3.7555	0.4700	1.61659	36.6	16	-0.9252	0.0046		
8	80.9316	0.0046			17	4.4424	0.1393	1.69680	55.6
9	1.1565	0.0650	1.67000	57.3	18	-2.2486			

$$0.1644^* = 0.0822 + 0.0822$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00349	0.00253	-0.00087	-0.00390	-0.01754	1	-1.9%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.00249	-0.01943	0.00460	0.01006	-0.00546	-0.002499	-0.001248
70	-0.00728	-0.01702	-0.00655	-0.01192	0.00537	-0.001895	-0.000489



编号: 07-02-059

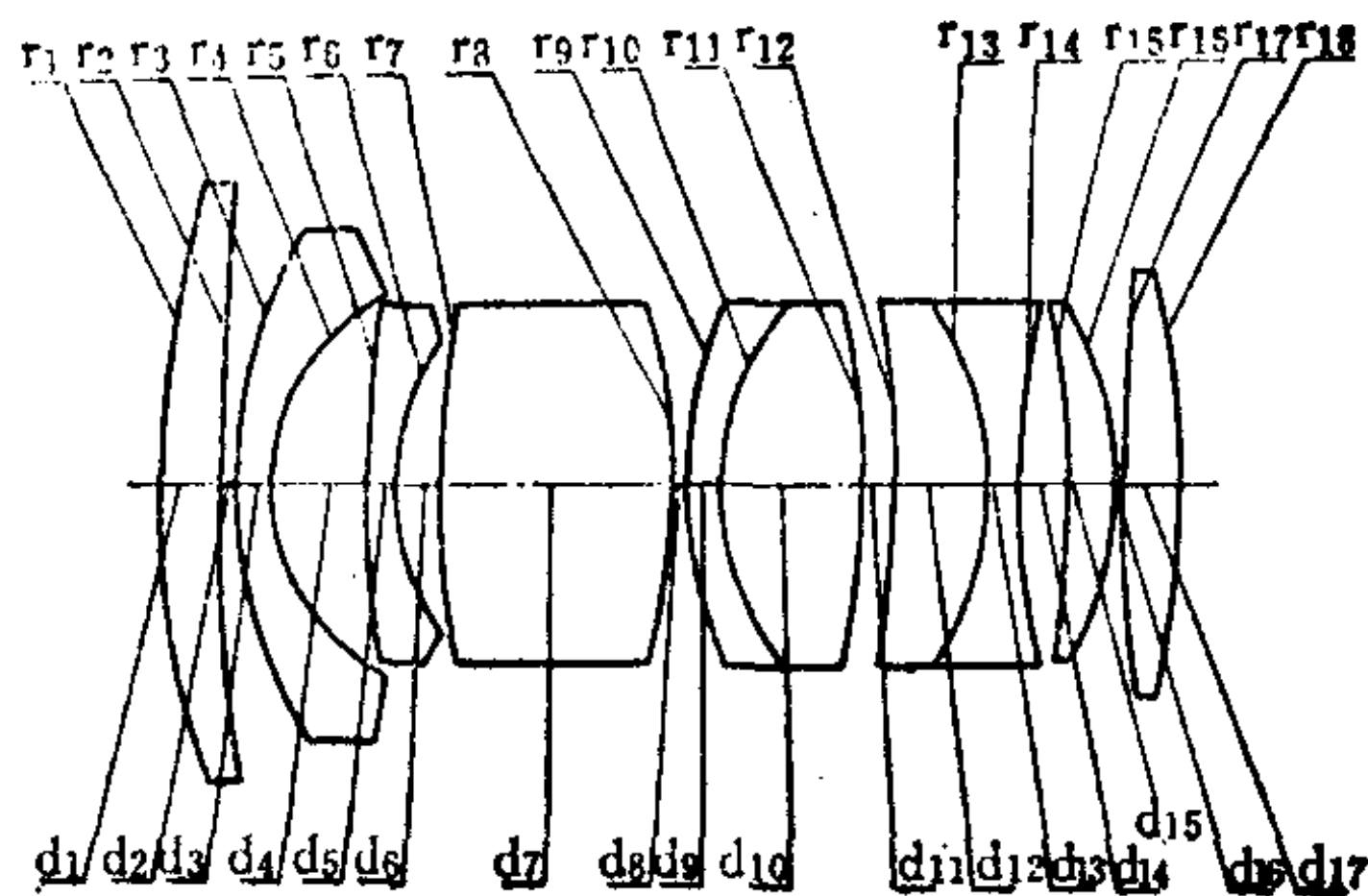
超广角大孔径照相物镜

E. F. L = 1

B. F. L = 1.7449

FN₀ = 2

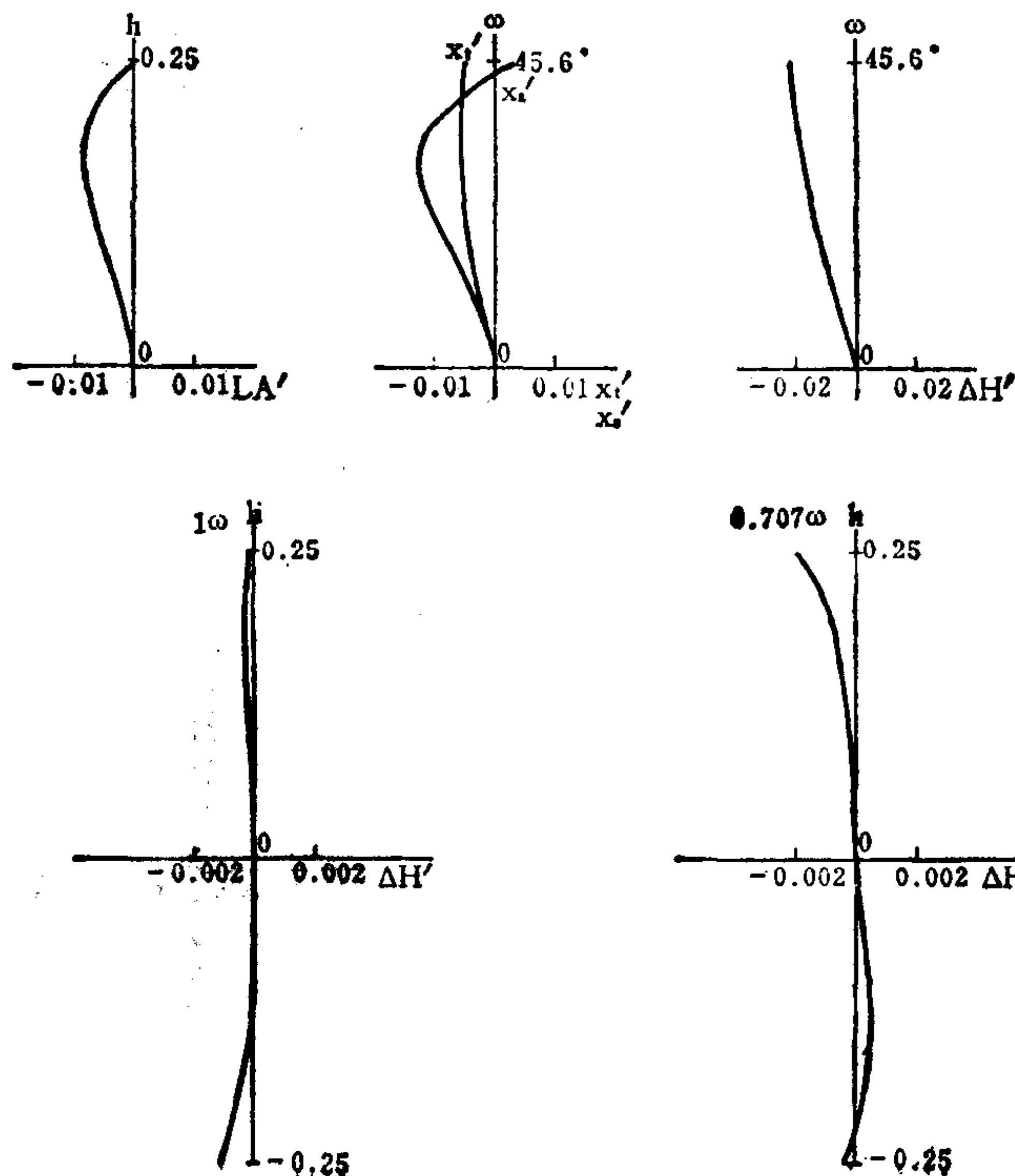
F. A. = ± 45.6°



序号	r	d	n	v	序号	r	d	n	v
1	2.2985	0.1861	1.72000	43.7	10	0.6664	0.3582	1.59270	35.5
2	6.1755	0.0060			11	-2.2077	0.0791*		
3	1.2449	0.0698	1.72000	50.3	12	-19.9488	0.2256	1.76200	40.2
4	0.5505	0.2117			13	-0.8204	0.0698	1.80518	25.4
5	2.7180	0.0698	1.75700	47.9	14	1.5855	0.1037		
6	0.6417	0.0921			15	-4.4064	0.1303	1.61800	63.4
7	3.1449	0.5624	1.61659	36.6	16	-0.9207	0.0070		
8	-6.8093	0.0047			17	7.4043	0.1396	1.69680	55.6
9	1.1094	0.0698	1.67000	57.3	18	-1.8352			

$$0.0791^* = 0.0400 + 0.0391$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP (1ω)
	-0.00387	0.00206	-0.00002	-0.00411	-0.01912	1	-2.2%
h 或 ω %	LA'	ΔH'	x _t '	x _s '	x _t ' - x _s '	K _{T1}	K _{T0.7}
100	0.00055	-0.02281	-0.00525	0.00325	-0.00850	-0.000619	-0.000349
70	-0.00837	-0.01792	-0.00559	-0.01303	0.00744	-0.001210	-0.000107



编号: 07-02-060

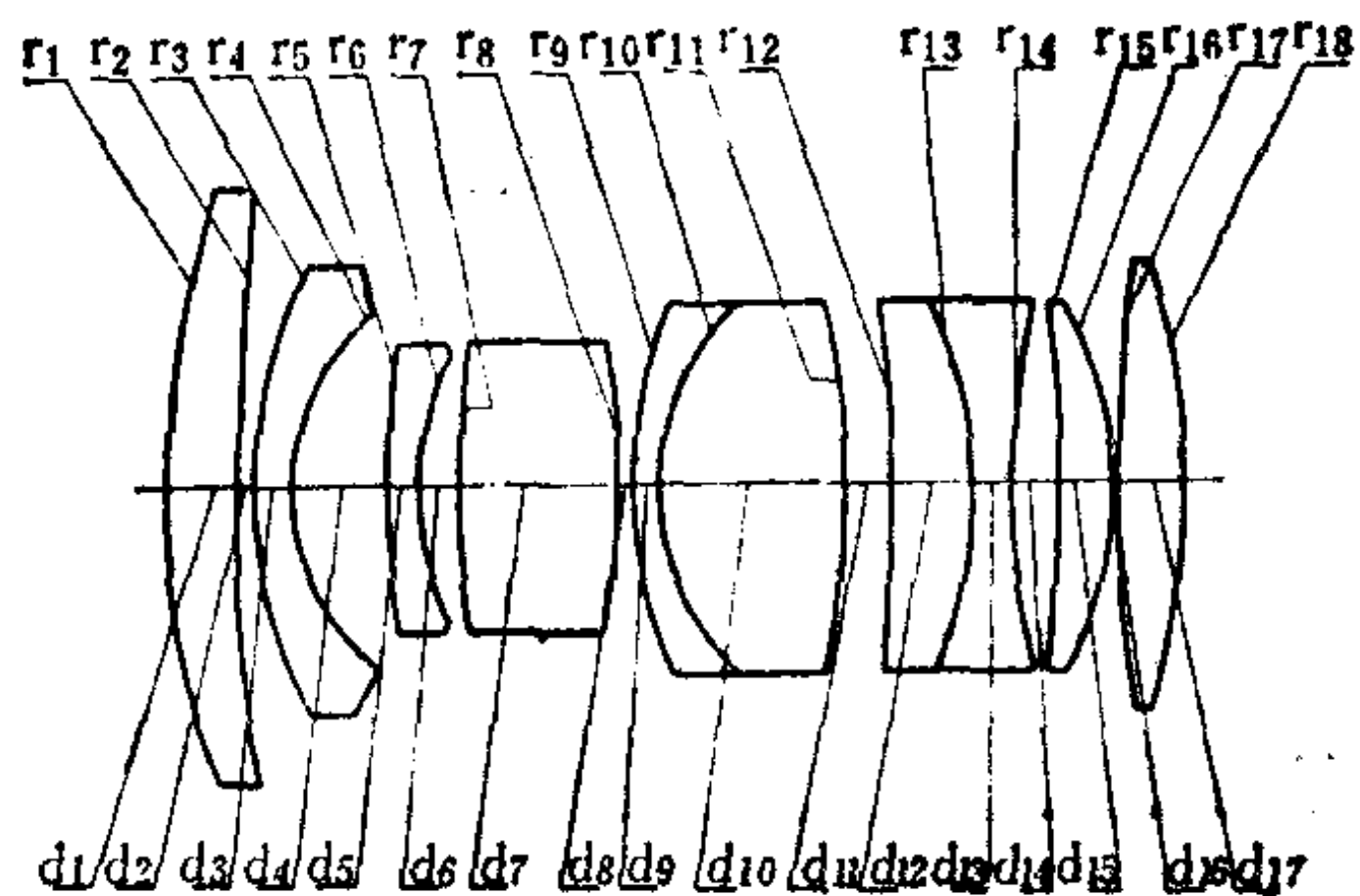
超广角大孔径照相物镜

E. F. L = 0.992

B. F. L = 1.7498

FNo. = 2

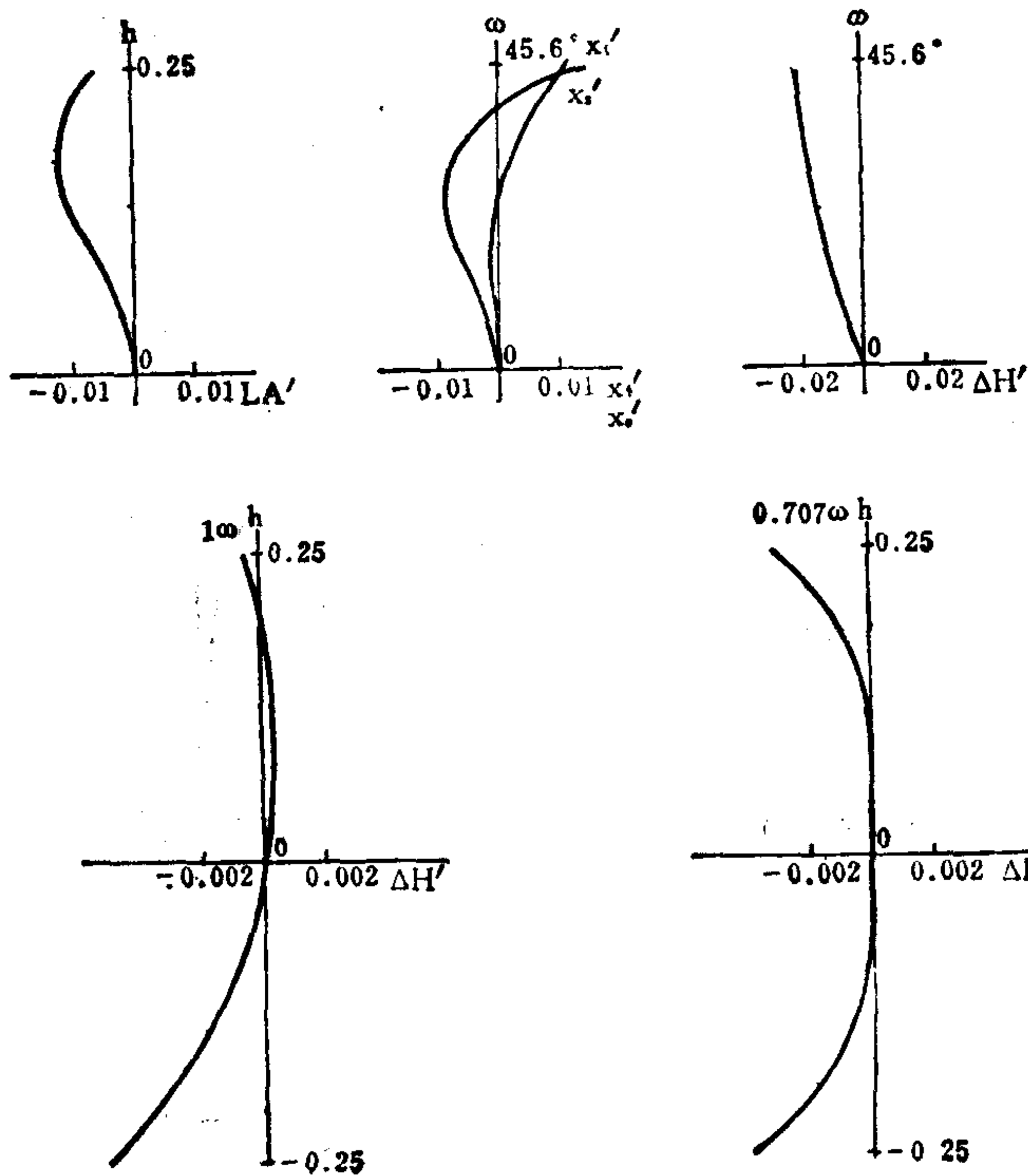
F. A. = $\pm 45.6^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	2.1566	0.1859	1.72000	43.7	10	0.6404	0.4359	1.59340	34.8
2	5.5649	0.0060			11	-1.7832	0.1041*		
3	1.1925	0.0697	1.72000	50.3	12	-12.1151	0.2012	1.75700	47.9
4	0.5291	0.2310			13	-0.8601	0.0697	1.80518	25.4
5	2.6413	0.0651	1.75700	47.9	14	1.8440	0.1204		
6	0.6309	0.0976			15	-3.1194	0.1301	1.69680	55.6
7	3.9450	0.3837	1.61659	36.6	16	-0.9239	0.0093		
8	-11.2560	0.0046			17	8.9834	0.1394	1.69680	55.6
9	1.0887	0.0651	1.67000	57.3	18	-1.7999			

$$0.1041^* = 0.0521 + 0.0520$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.005291	0.002613	0.000101	-0.003621	-0.020032	1	-2.3%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00680	-0.02332	0.01298	0.01516	-0.00218	-0.0020707	-0.001314
70	-0.01253	-0.01795	0.00174	-0.00812	0.00986	-0.003646	-0.001075



编号: 07-02-061

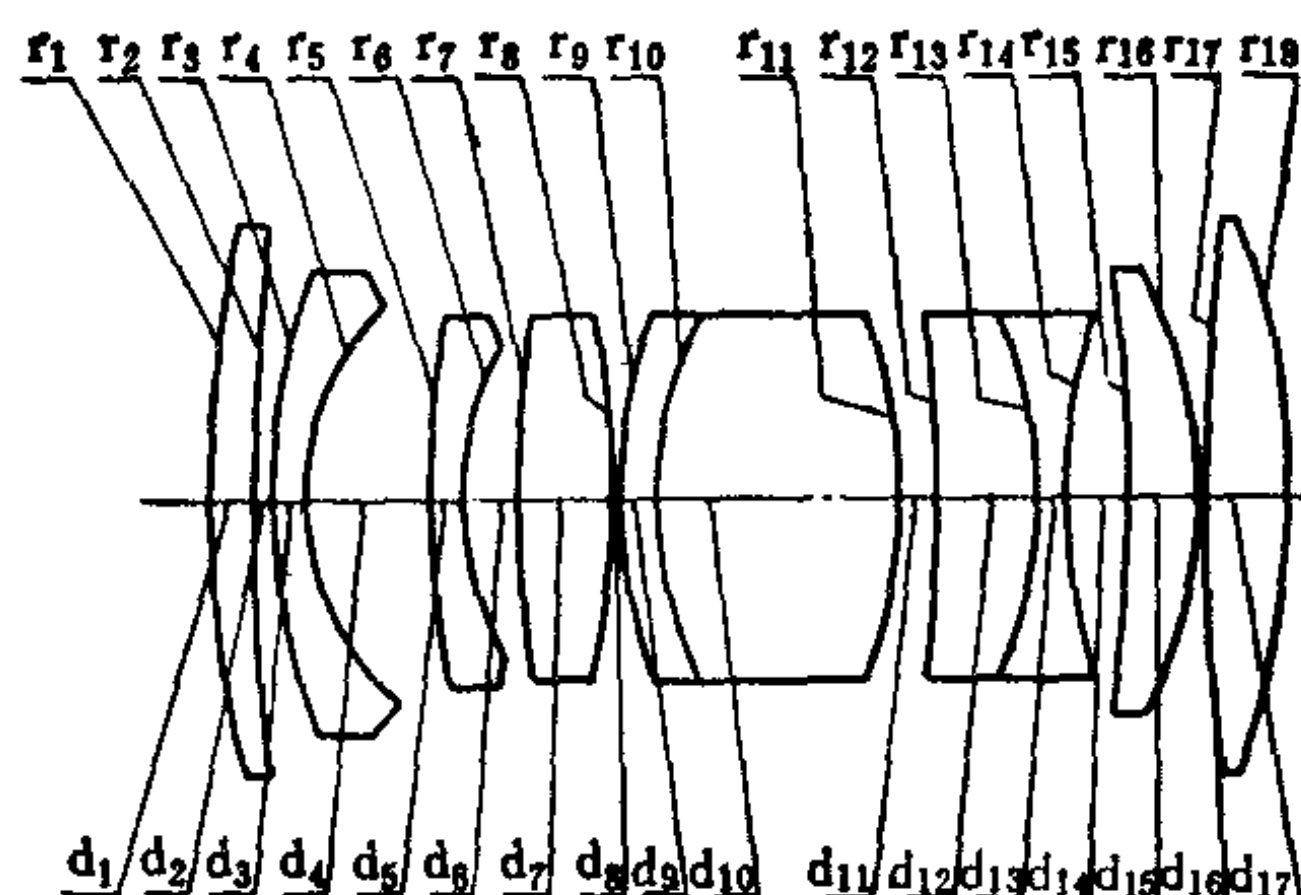
超广角大孔径照相物镜

E. F. L = 1

B. F. L = 1.7555

FNo. = 2

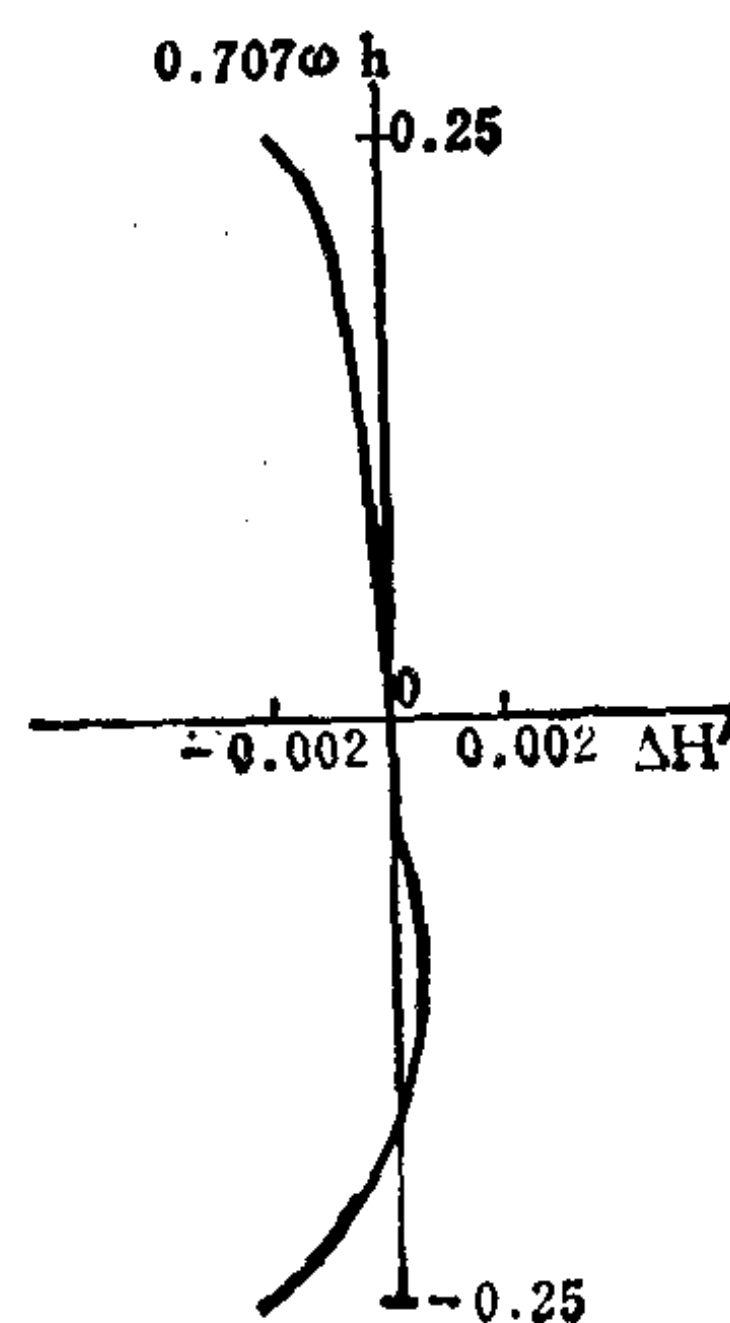
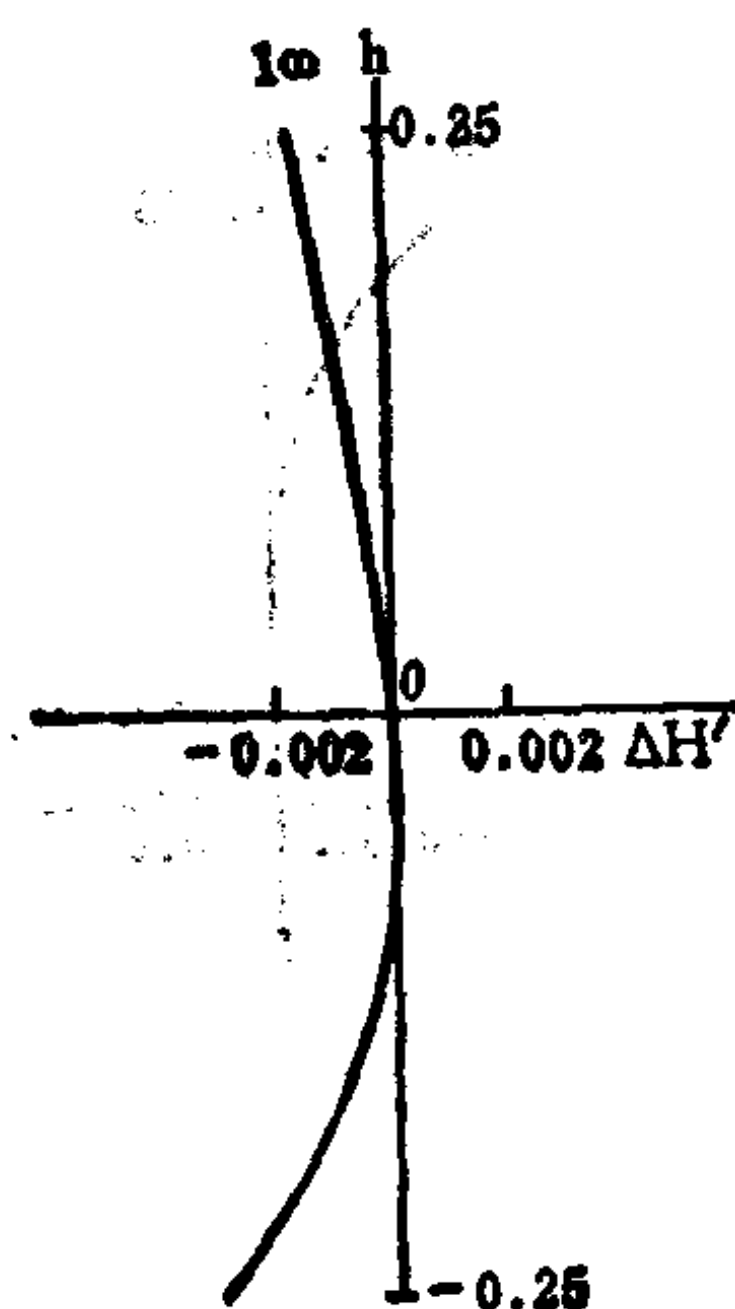
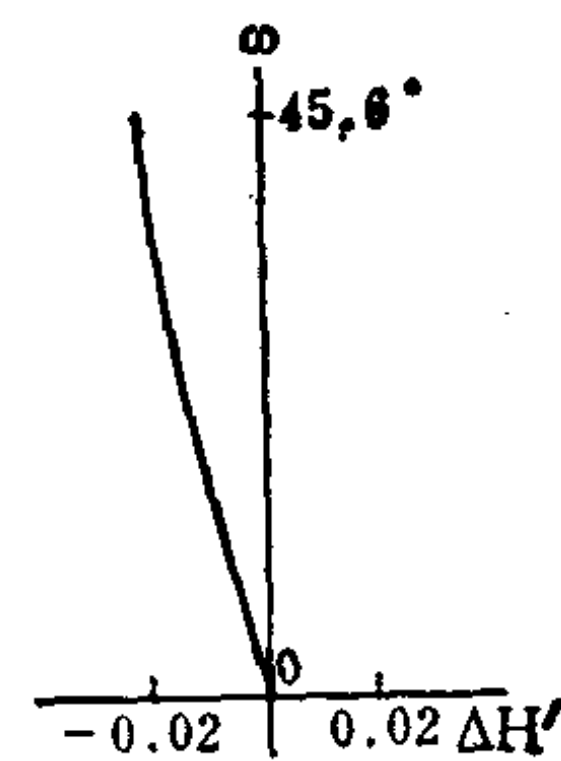
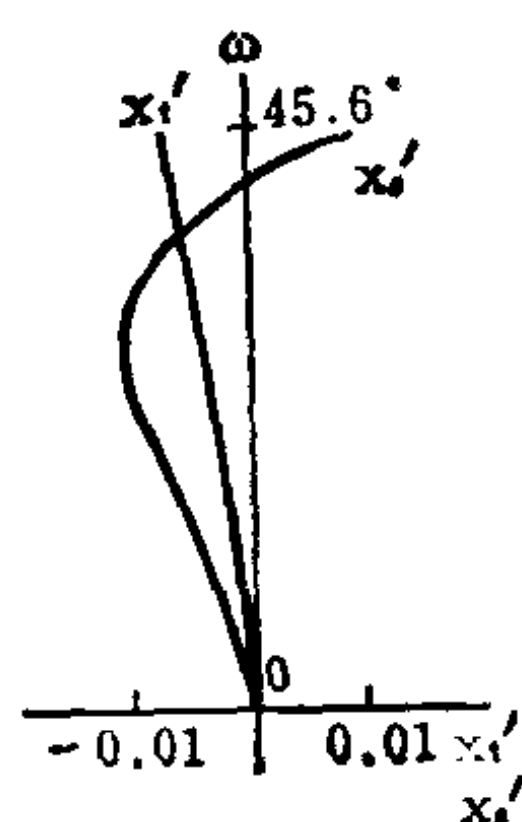
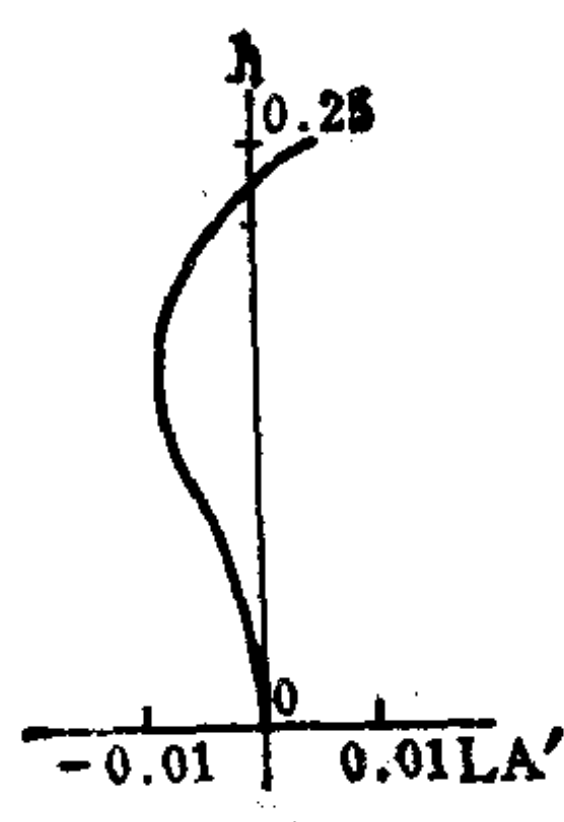
F. A. = $\pm 45.6^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	2.1413	0.1860	1.72000	43.7	10	0.6588	0.4655	1.59270	35.5
2	5.5682	0.0060			11	-1.6073	0.1042*		
3	1.2587	0.0698	1.72000	50.3	12	-6.3013	0.1753	1.75700	47.9
4	0.5311	0.2320			13	-0.8649	0.0698	1.80518	25.4
5	2.4881	0.0651	1.75700	47.9	14	1.8400	0.1046		
6	0.6393	0.0977			15	-3.0518	0.1395	1.69680	55.6
7	4.2587	0.3636	1.61659	36.6	16	-0.9570	0.0093		
8	-7.5941	0.0047			17	11.4357	0.1395	1.69680	55.6
9	1.0986	0.0651	1.67000	57.3	18	-1.5778			

$$0.1042^* = 0.0521 + 0.0521$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00467	0.00299	-0.00088	-0.00378	-0.01882	1	-2.1%
h 或 ω %	LA'	$\Delta H'$	x'_i	x'_s	$x'_i - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.00429	-0.02192	-0.00693	0.00883	-0.01576	-0.002397	-0.001160
70	-0.00834	-0.01805	-0.00544	-0.01129	0.00585	-0.002281	-0.000381



编号: 07-02-062

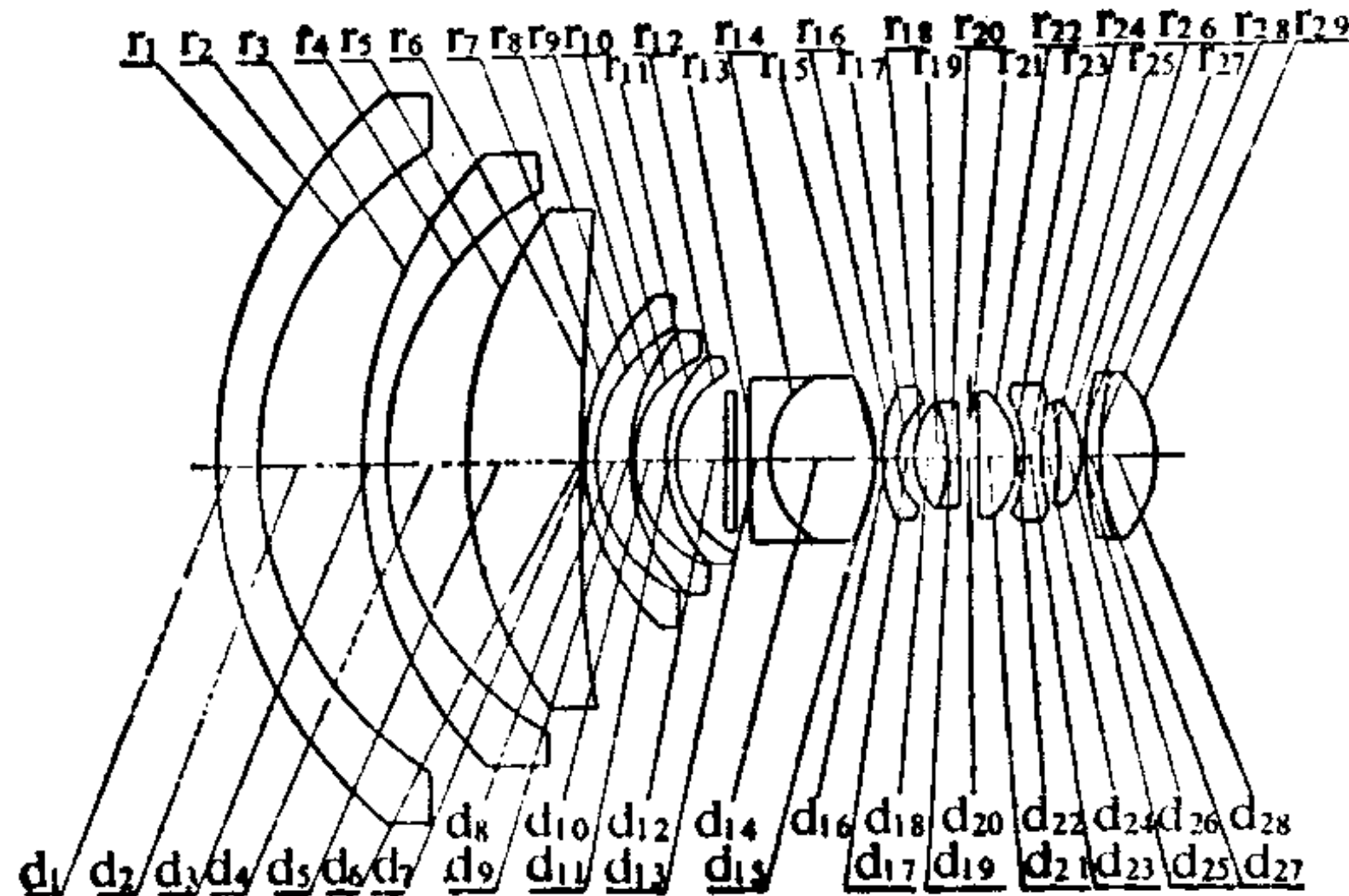
反远距型超广角物镜

E. F. L = 13.01

B. F. L = 37.28

FNo. = 7.9

F. A. = $\pm 40^\circ$ **



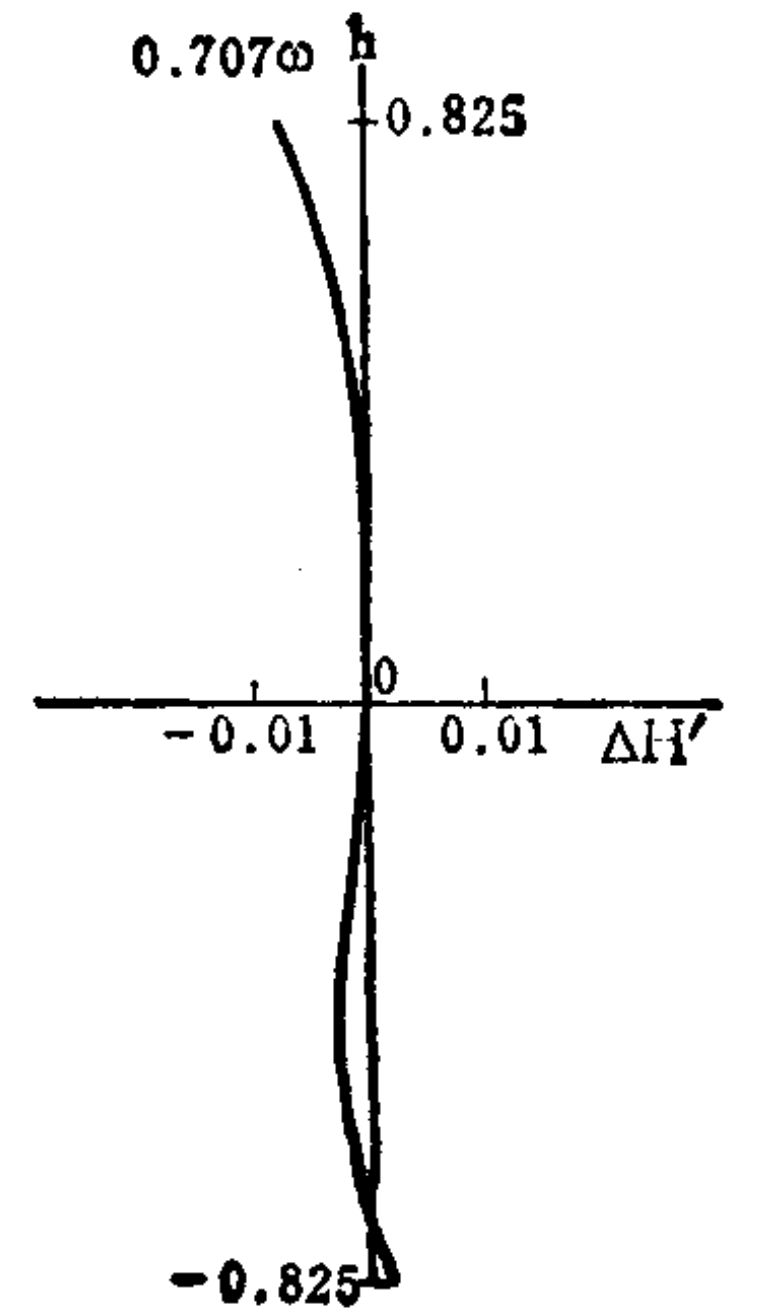
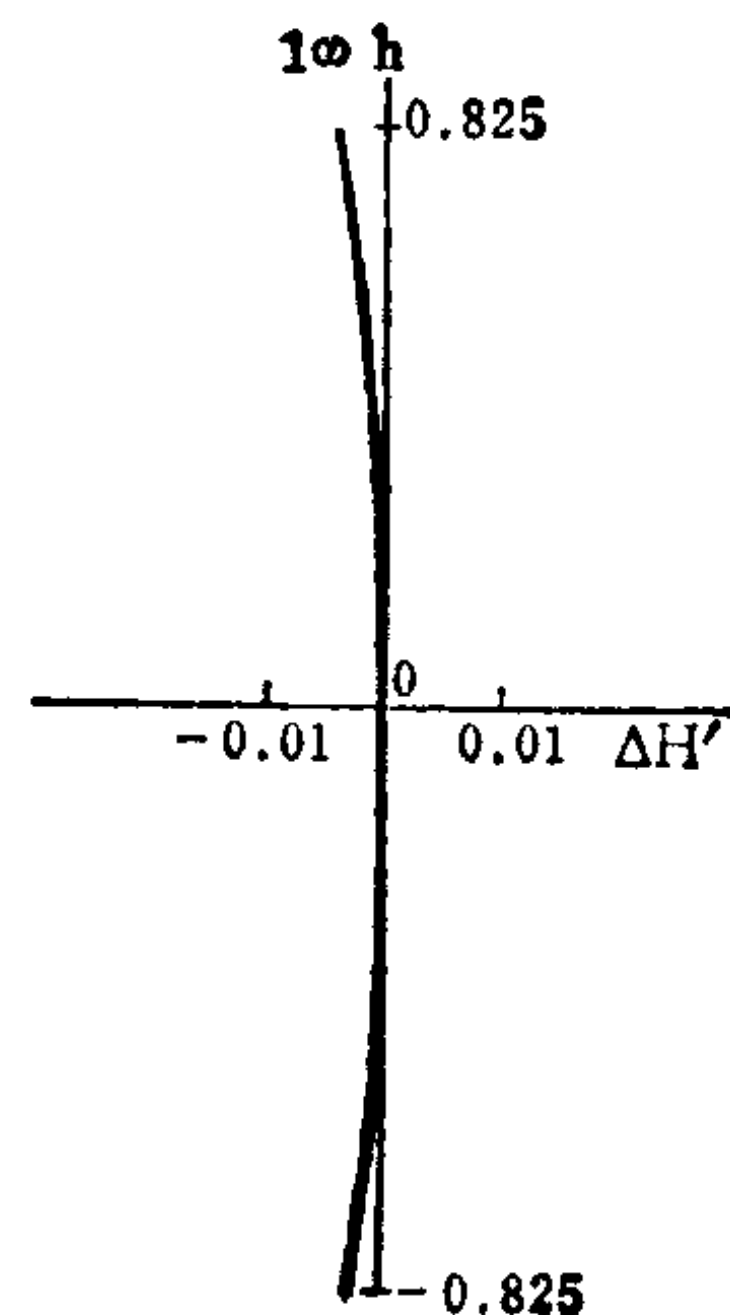
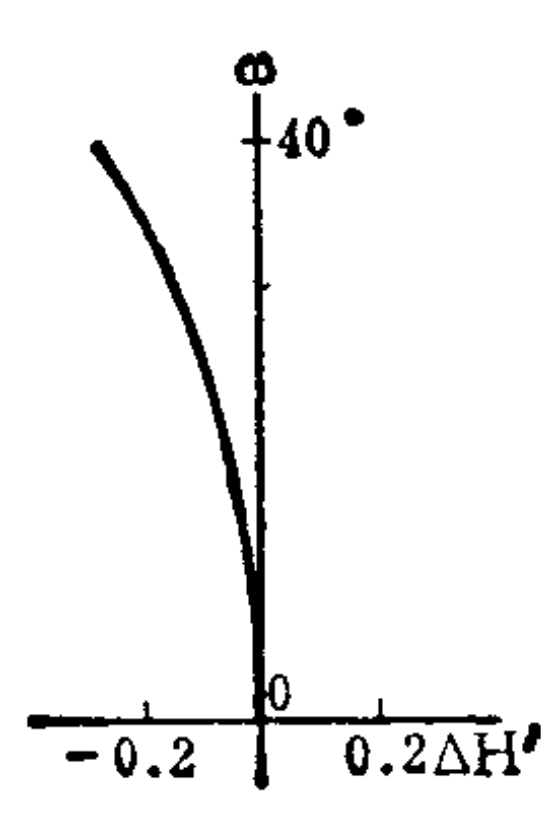
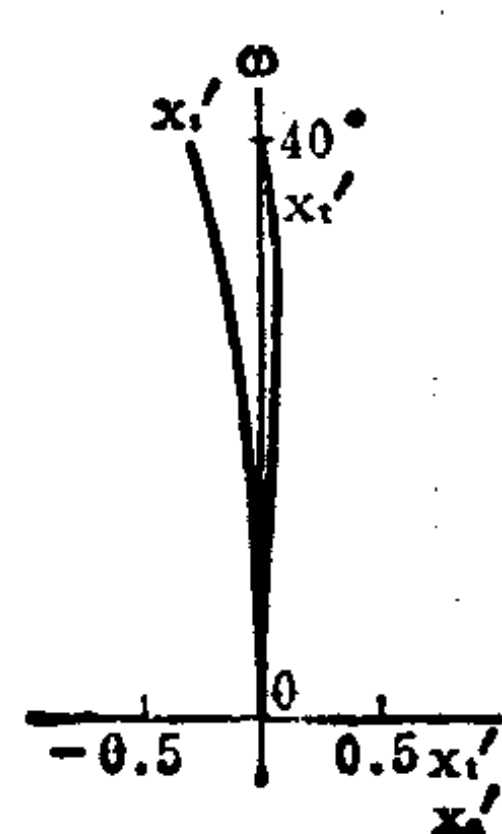
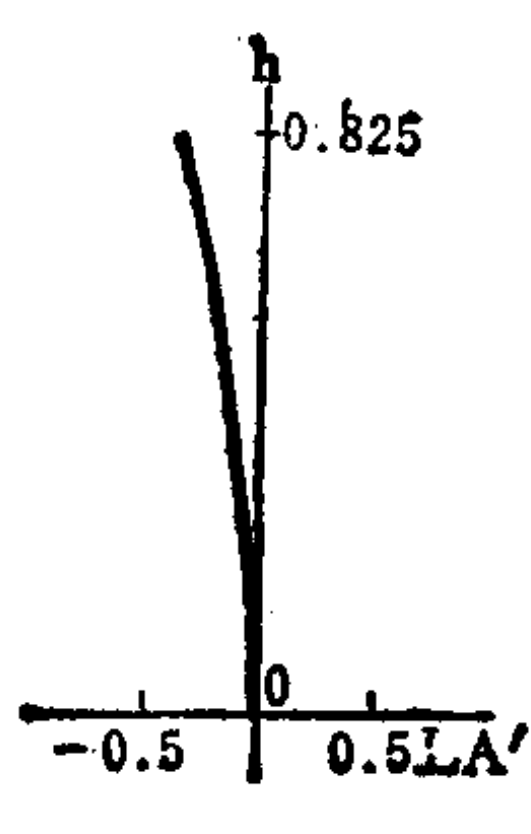
序号	r	d	n	v_d	序号	r	d	n	v_d
1	57.200	3.90	1.77279	49.5	15	-15.800	0.10		
2	43.000	11.90			16	17.000	0.80	1.69680	55.6
3	51.000	3.00	1.73350	51.0	17	7.450	1.70		
4	37.500	9.30			18	11.900	2.80	1.59507	35.6
5	48.200	13.50	1.73200	53.7	19	-9.000	0.90	1.60311	60.7
6	190.000	0.10			20	∞	1.60*		
7	28.500	1.20	1.73350	51.0	21	∞	4.10	1.59507	35.6
8	17.600	3.30			22	-10.500	0.60		
9	22.500	1.00	1.73200	53.7	23	-13.100	1.50	1.86074	23.1
10	13.200	3.00			24	35.400	0.65		
11	17.600	1.00	1.73200	53.7	25	-41.000	2.20	1.44628	67.2
12	12.000	8.20			26	-9.600	0.10		
	∞				27	900.000	0.80	1.86630	37.9
	∞				28	30.700	5.70	1.48749	70.0
13	350.000	3.00	1.83739	43.5	29	-14.901			
14	12.080	12.30	1.54072	47.2					

$$1.60^* = 0.80 + 0.80$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00315	0.00648	-0.01161	-0.00340	-0.00983	1	-2.6%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.349	-0.2856	0.00015	-0.30681	0.30696	-0.002889	-0.001628
70	-0.186	-0.1155	0.06417	-0.14354	0.20771	-0.002776	-0.002028

注: 1. 以上象差值计算时, 未考虑滤色片。

2. 滤色片的基底玻璃是K9, $d = 1.2$ 。



编号: 07-02-063

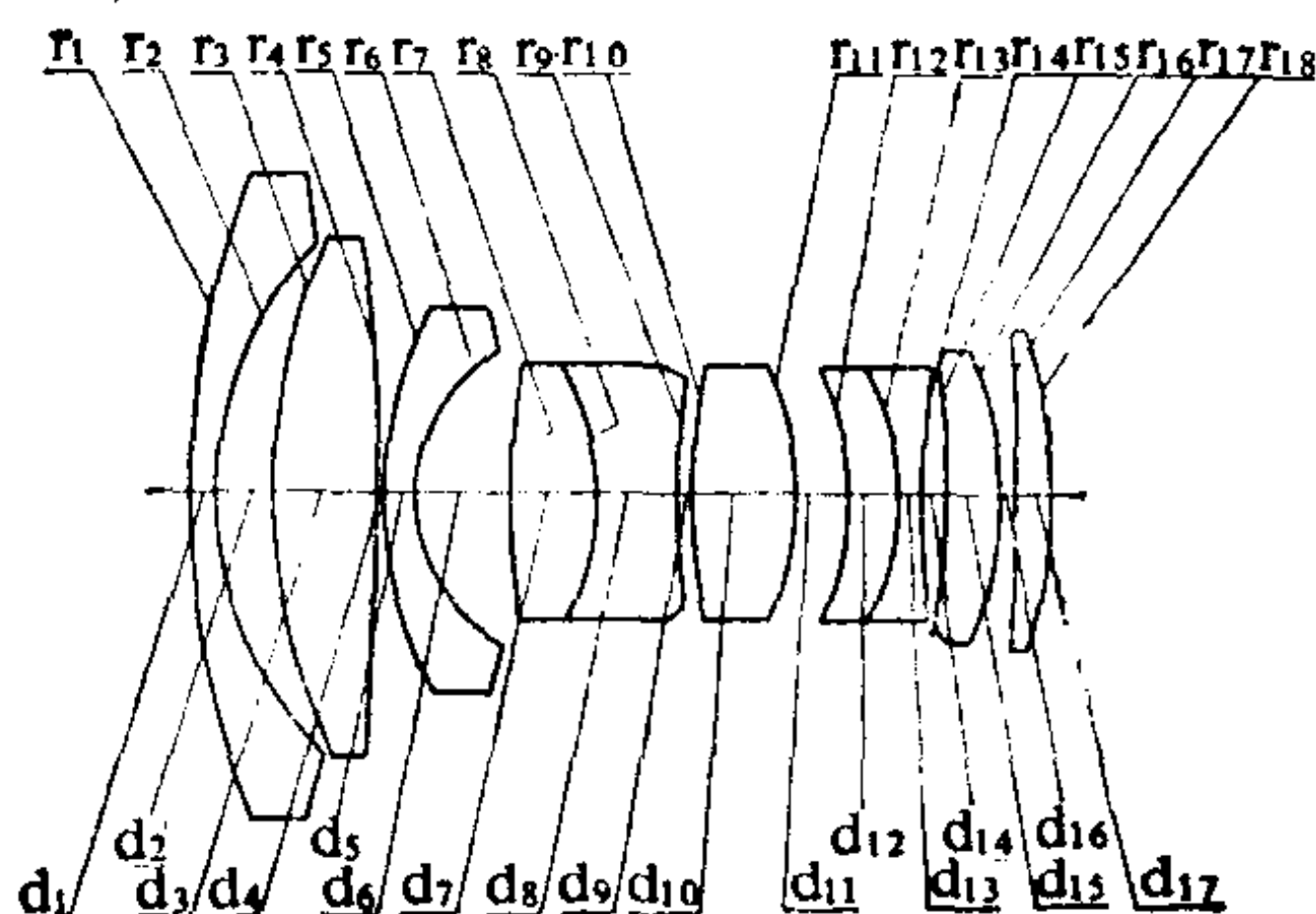
广 角 照 相 物 镜

E. F. L = 100

B. F. L = 156.64

FNo. = 2.8

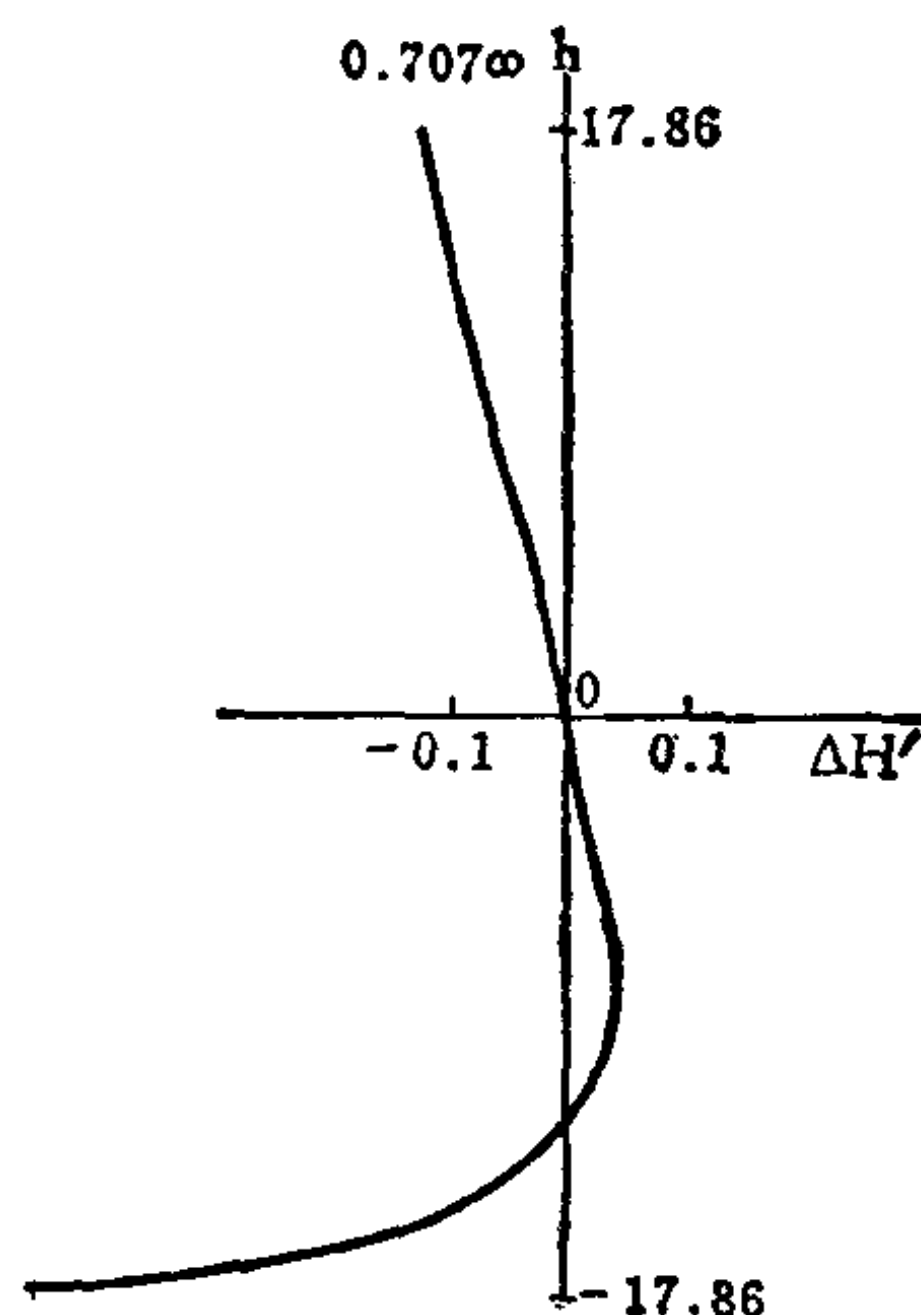
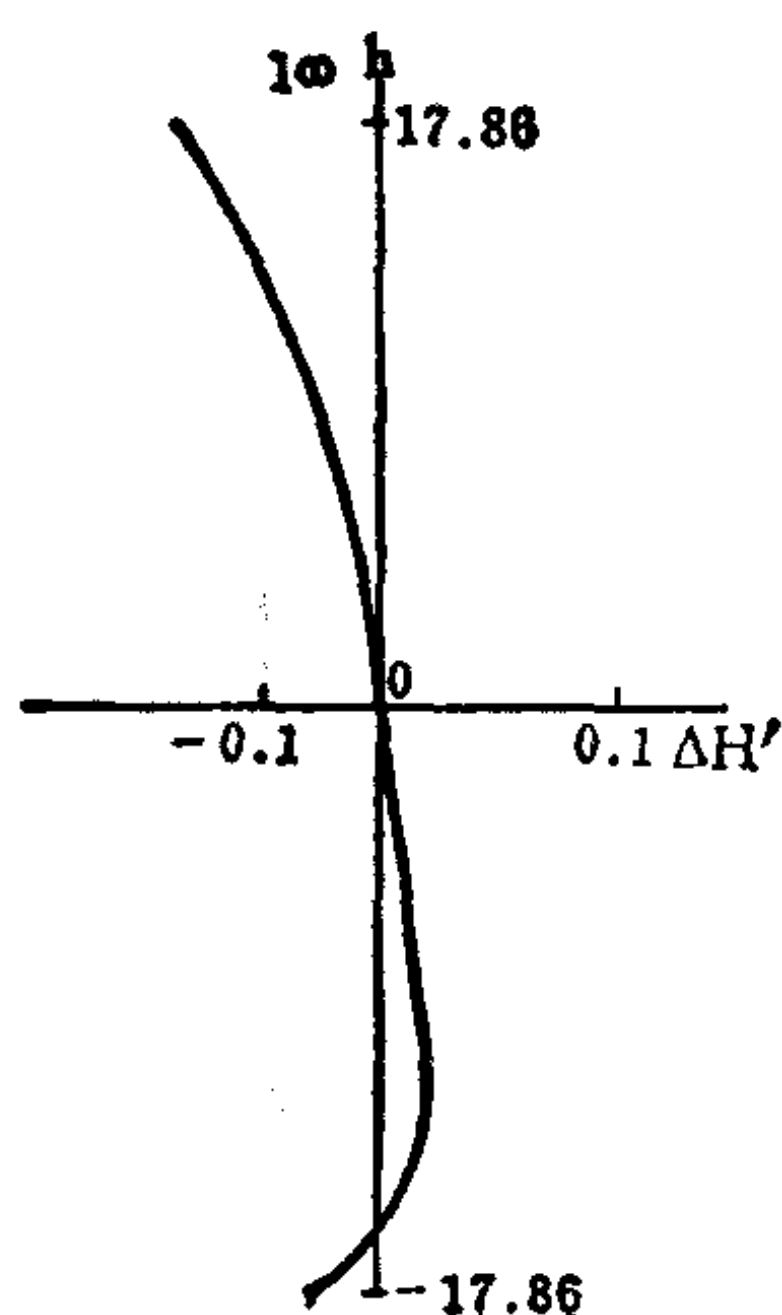
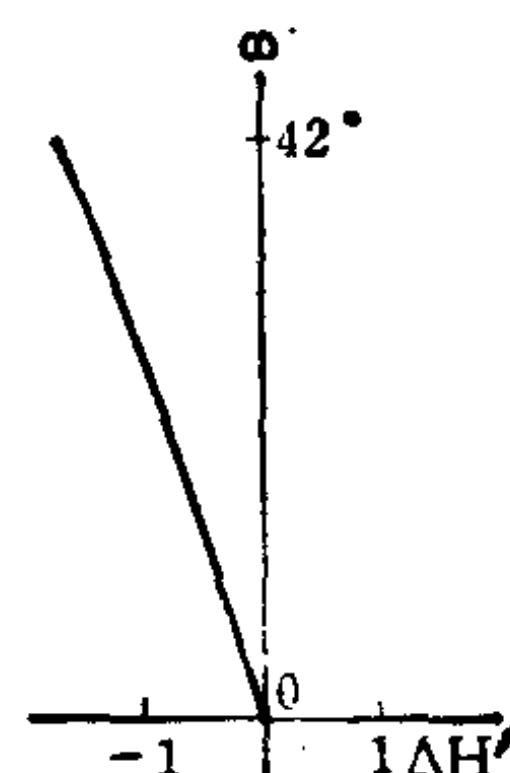
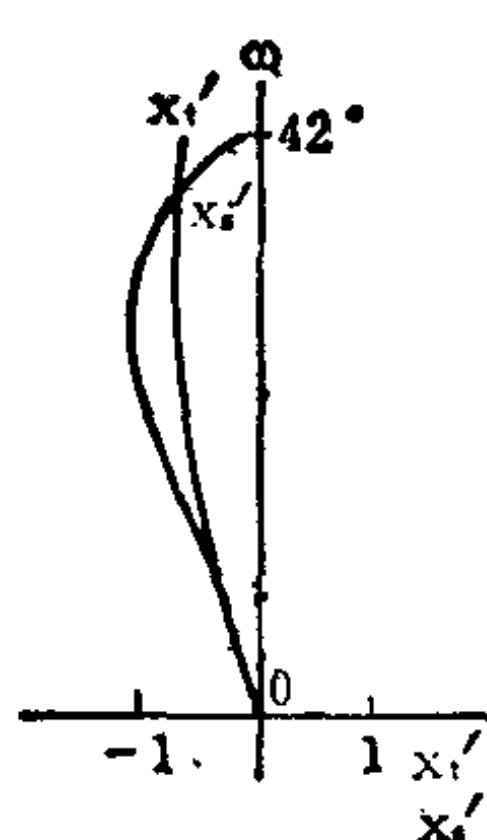
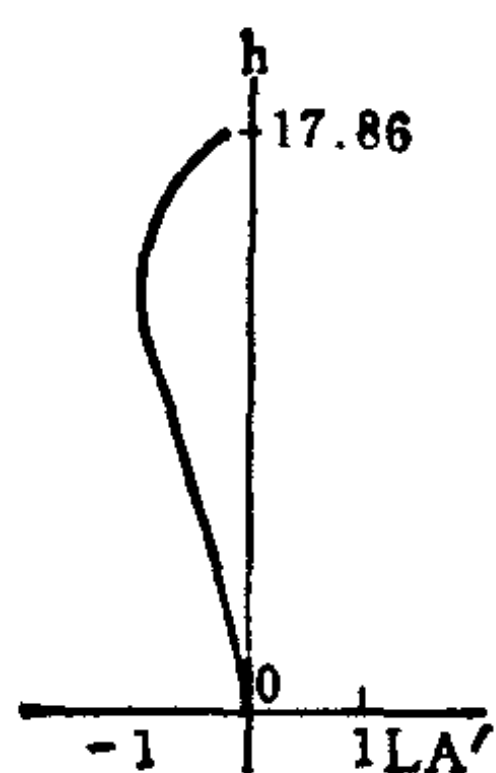
F. A. = $\pm 42^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	195.05	7.5	1.6204	30.3	10	158.20	22.50	1.6700	57.3
2	85.38	14.58			11	- 79.50	12.08*		
3	157.55	22.92	1.6510	56.2	12	- 75.56	12.50	1.7570	47.9
4	- 2594.05	0.83			13	- 50.29	6.25	1.6989	30.1
5	99.68	6.25	1.5891	61.1	14	218.85	3.79		
6	38.99	22.50			15	- 215.93	11.67	1.6968	55.6
7	368.12	18.75	1.6129	37.0	16	- 72.68	0.83		
8	- 59.99	19.58	1.7130	53.9	17	- 2105.58	10.83	1.6968	55.6
9	475.55	2.50			18	- 116.19			

12.08* = 6.00 + 6.08

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	- 0.1737	0.0800	0.0146	- 0.1960	- 1.0432	90	- 1.9%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	- 0.126	- 1.763	- 0.638	0.054	- 0.692	- 0.12119	- 0.02404
70	- 0.844	- 1.220	- 0.731	- 1.089	0.358	- 0.28754	- 0.05036



编号: 07-02-064

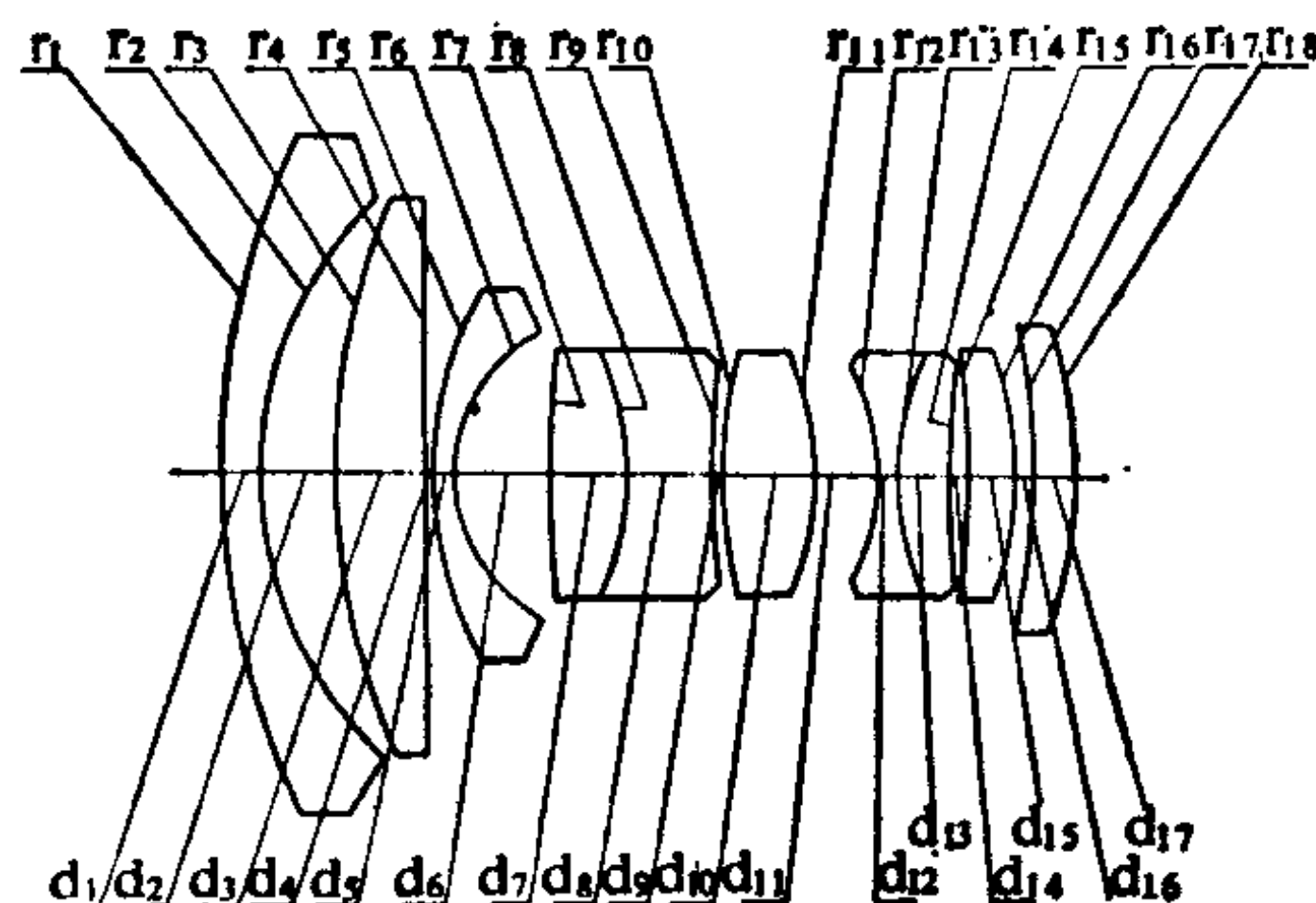
广角照相物镜

E. F. L = 99.4

B. F. L = 154.3

FNo. = 2.78

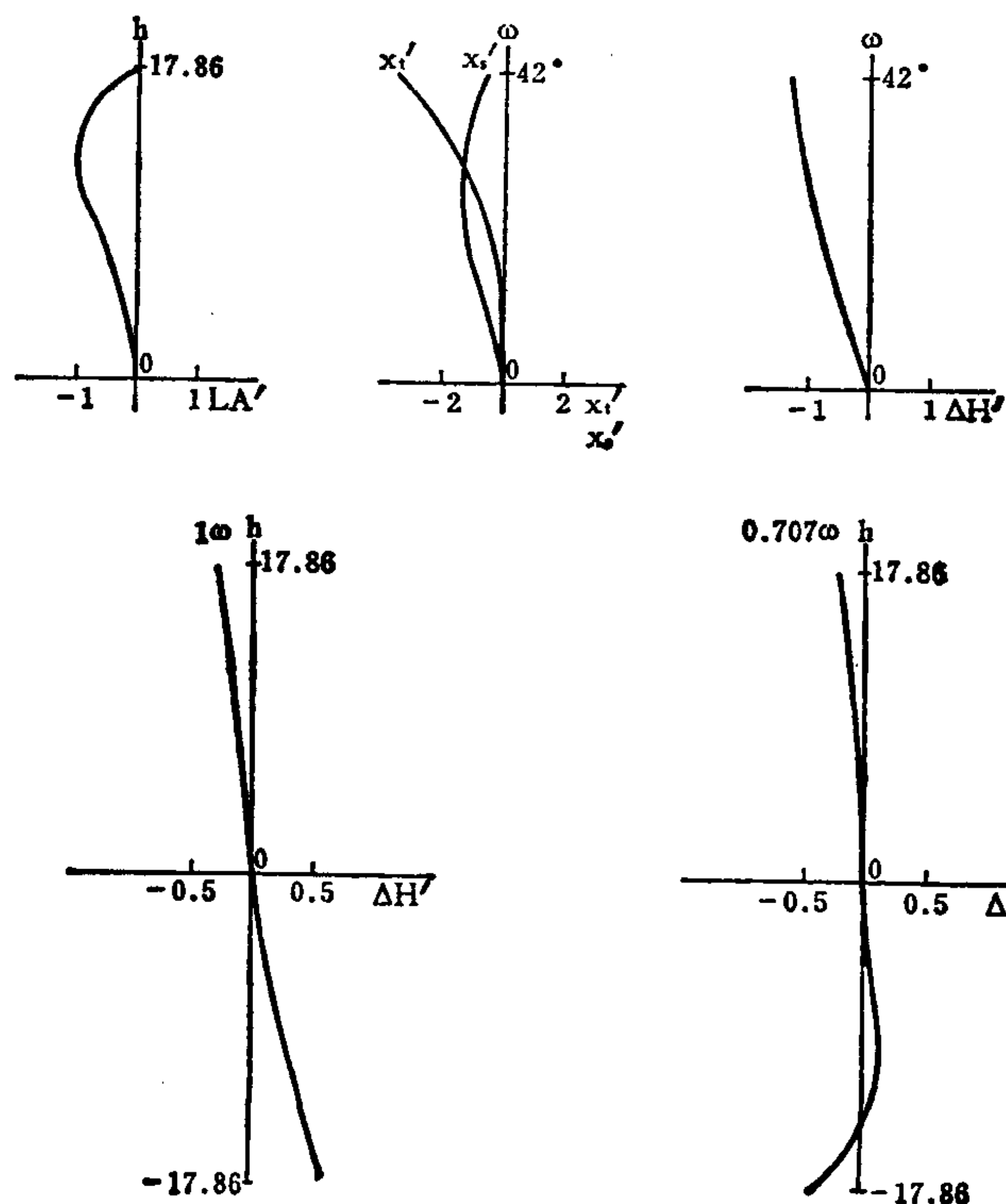
F. A. = $\pm 42^\circ$



序号	r	d	n	v	序号	r	d	n	v
1	203.53	7.50	1.69350	53.34	10	207.57	22.50	1.67000	57.33
2	92.35	15.83			11	-73.95	12.08*		
3	152.42	22.50	1.71700	47.94	12	-73.27	6.25	1.68893	31.08
4	∞	1.23			13	68.68	12.50	1.74320	49.37
5	102.17	6.25	1.58913	61.11	14	216.39	3.79		
6	38.62	22.92			15	-241.78	11.25	1.69680	55.62
7	253.44	18.75	1.61923	37.00	16	-73.40	0.83		
8	-58.34	20.00	1.71300	53.98	17	-784.30	10.42	1.69680	55.62
9	332.03	2.08			18	-103.79			

$$12.08^* = 6.00 + 6.08$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.1975	0.0871	0.0069	-0.2057	-1.0063	89.5	-1.5%
h 或 ω %	LA'	$\Delta H'$	x'_i	x'_s	$x'_i - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.022	-1.357	-3.531	-0.542	-2.989	0.1527	0.1052
70	-0.939	-1.151	-1.181	-1.247	0.066	-0.3296	-0.0472



编号: 07-02-065

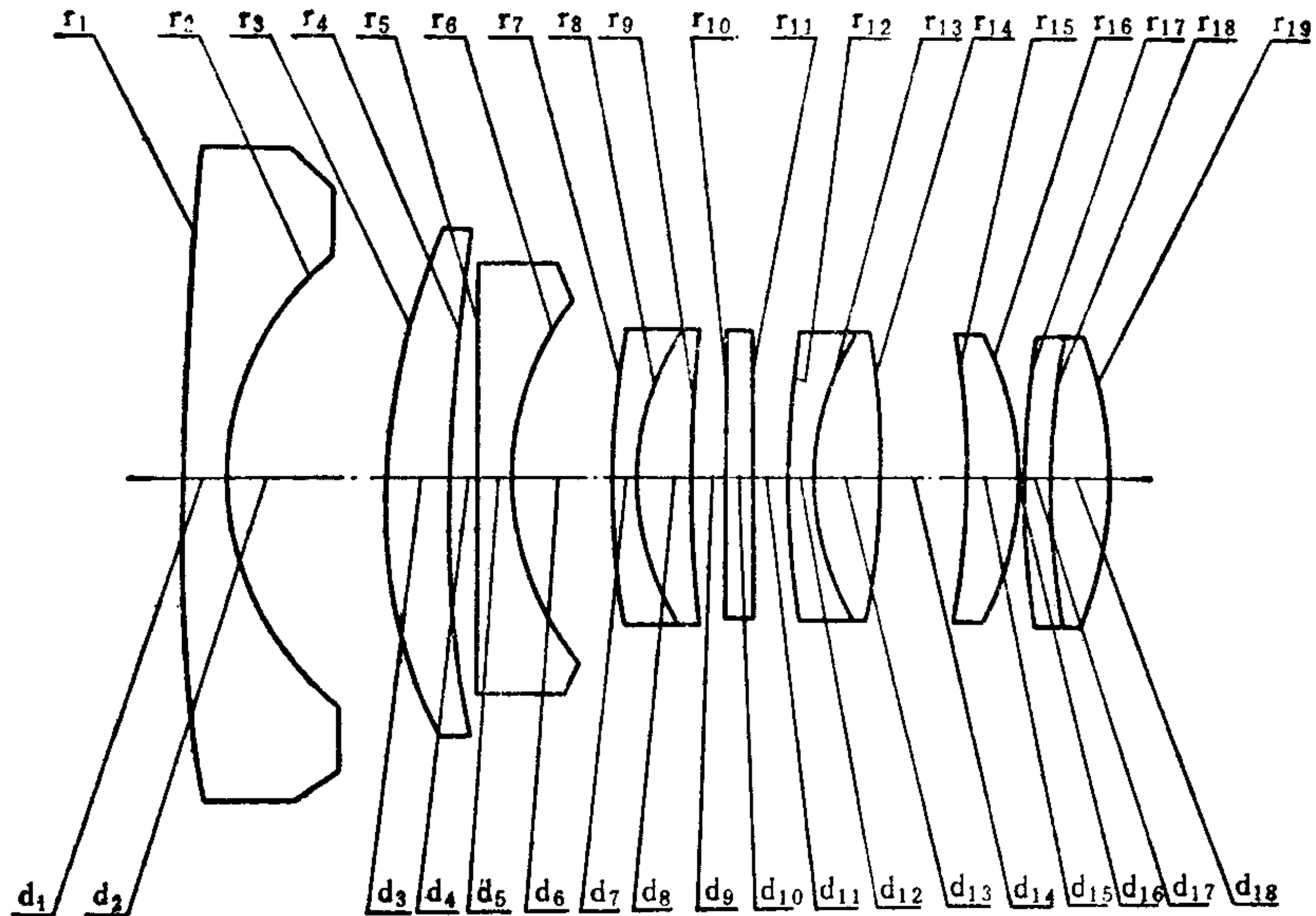
鱼 眼 物 镜

E. F. L = 1

B. F. L = 2.2916

FNo. = 3.5

F. A. = $\pm 90^\circ$



序 号	r	d	n	v
1	5.5184	0.1237	1.58913	61.10
2	0.7370	0.4157		
3	1.6084	0.1856	1.7859	44.24
4	3.4234	0.0928		
5	-86.6068	0.0742	1.58913	61.10
6	0.6965	0.2598		
7	1.8556	0.0619	1.69680	55.60
8	0.6771	0.1534	1.69895	30.10
9	46.7176	0.0792		
10	∞	0.0742	1.51630	64.10
11	∞	0.0829		
12	2.2085	0.0749	1.78472	25.70
13	0.6517	0.2017	1.60342	38.00
14	-6.6704	0.2116		
15	-2.4646	0.1237	1.51728	69.60
16	-1.1253	0.0062		
17	4.9175	0.0619	1.80518	25.40
18	1.3087	0.1856	1.51728	69.60
19	-1.1190			
20				

编号: 07-02-066

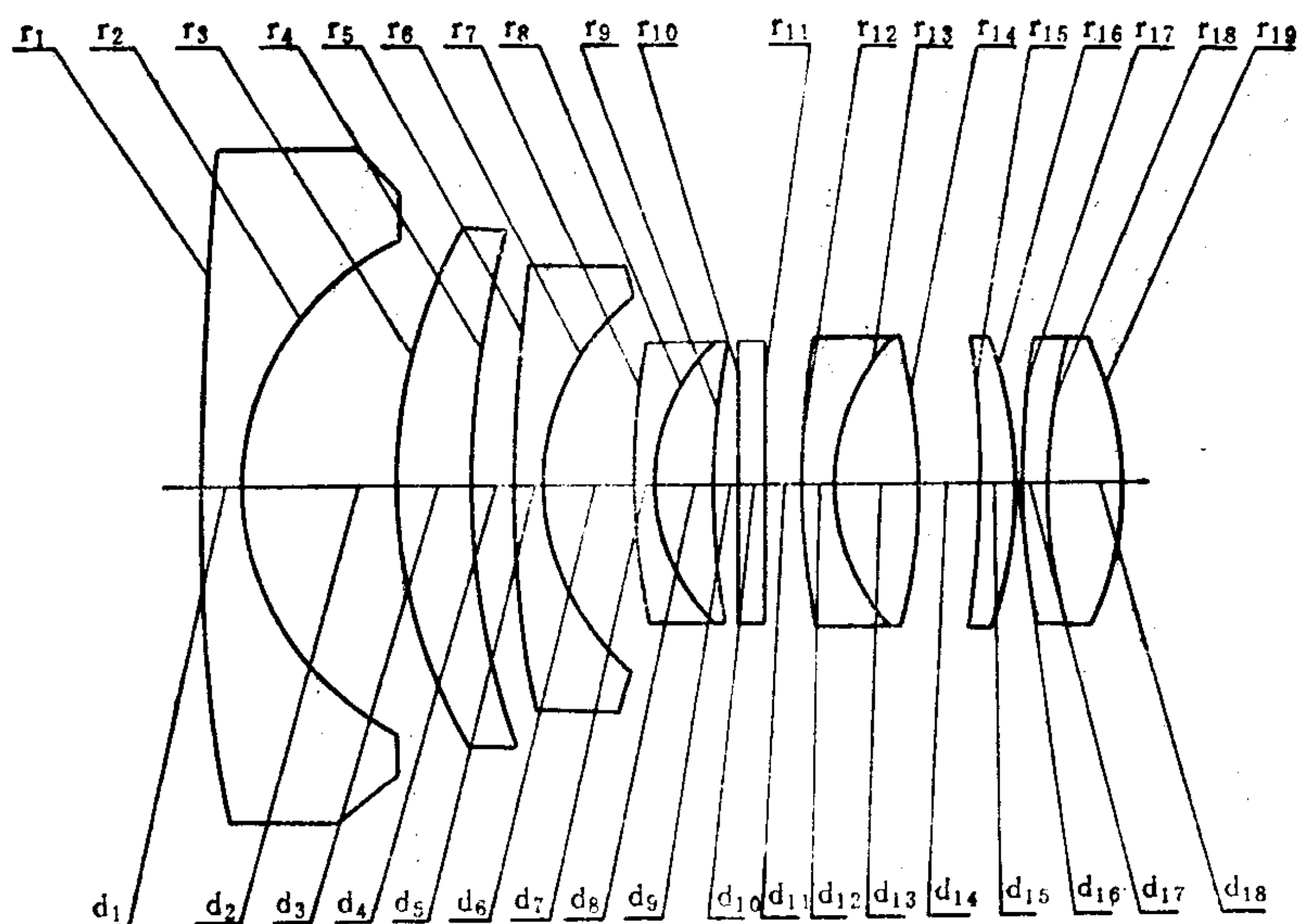
鱼 眼 物 镜

E. F. L = 1

B. F. L = 2.3236

FNo. = 3.5

F. A. = $\pm 90^\circ$

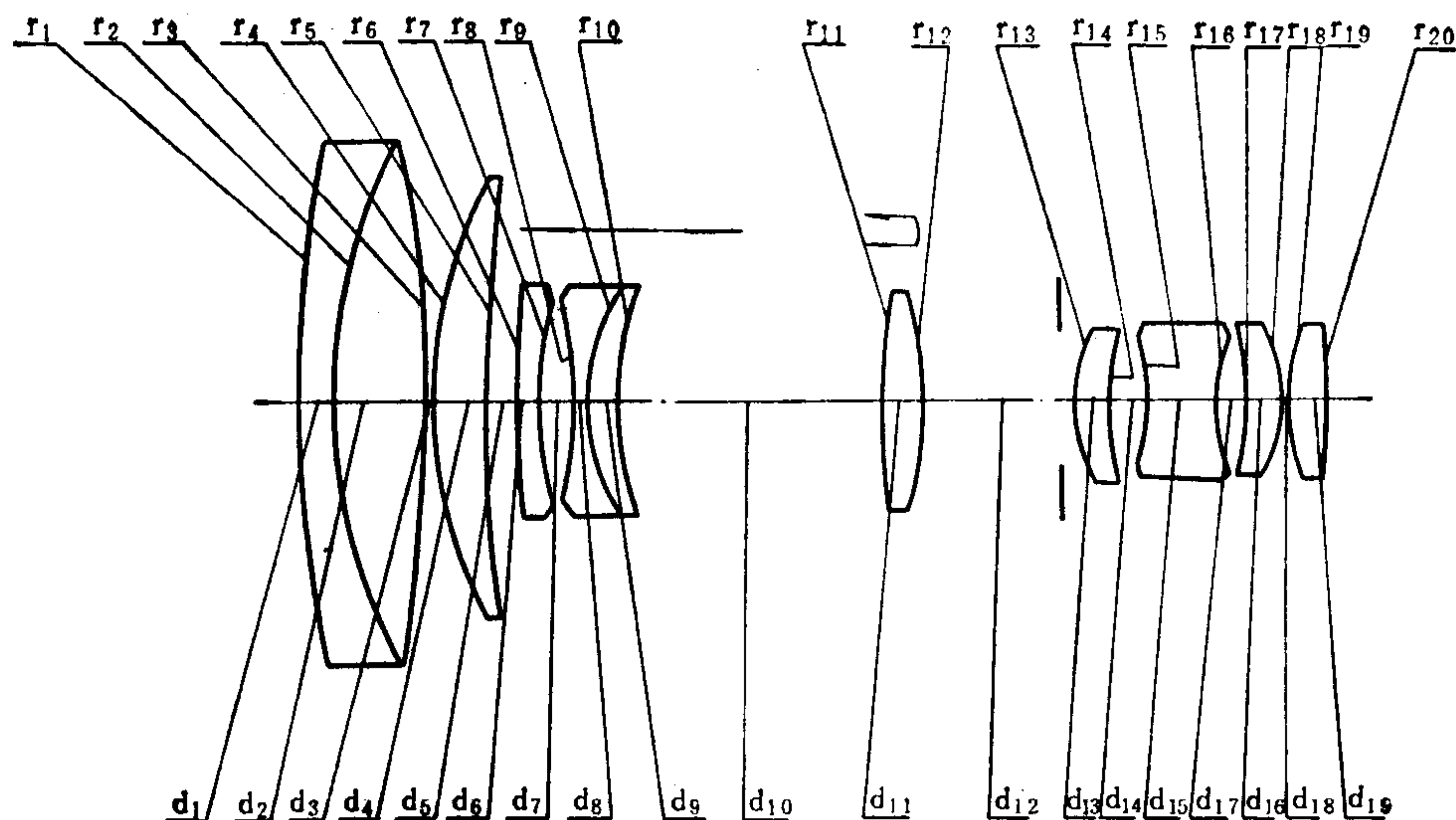


序 号	r	d	n	v
1	5.0022	0.1251	1.58913	61.1
2	0.7760	0.4030		
3	1.4287	0.1876	1.78590	44.2
4	2.3106	0.0938		
5	3.7526	0.0750	1.58913	61.1
6	0.6617	0.2257		
7	1.6285	0.0620	1.69680	55.6
8	0.4808	0.1376	1.69895	30.1
9	14.9131	0.0867		
10	∞	0.0750	1.51630	64.1
11	∞	0.0905		
12	5.0002	0.0684	1.78472	25.7
13	0.5855	0.2098	1.60342	38.0
14	-12.9796	0.2672		
15	-3.7255	0.1251	1.51728	69.6
16	-1.2370	0.0063		
17	3.9866	0.0625	1.80518	25.4
18	1.4291	0.1876	1.51728	69.6
19	-0.9695			
20				

编号: 07-03-067

变 焦 距 物 镜

E. F. L = 1 ~ 2.8537 B. F. L = 1.0915 FNo. = 1.8 F. A. = $\pm 19.5^\circ \sim \pm 6.5^\circ$



序 号	r	d	n	v
1	10.80075	0.16269	1.75520	27.5
2	3.60009	0.62204	1.58913	61.1
3	-11.32293	0.01435		
4	3.41704	0.38280	1.58913	61.1
5	21.40612	***1		
6	95.63595	0.08613	1.58913	61.1
7	1.75954	0.25839		
8	-2.36774	0.08613	1.58913	61.1
9	1.44821	0.19140	1.80518	25.4
10	3.53483	***2		
11	5.02420	0.19140	1.58913	61.1
12	-5.00752	***3*		
13	1.09030	0.24882	1.71300	54.0
14	28.82289	0.18689		
15	-2.02137	0.53125	1.80518	25.4
16	1.18086	0.11600		
17	-3.11684	0.22968	1.67000	57.4
18	-1.19169	0.00957		
19	1.33736	0.21054	1.77250	49.6
20	-6.74369			

07-03-067-1

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00317	-0.00073	0.00024	-0.00193	-0.00495	0.35	-3.2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K_{T1}	$K_{T0.7}$
100	-0.00413	-0.0115	-0.0077	-0.0089	0.0012	0.01000	0.00122
70	-0.00692	-0.0036	-0.0038	-0.0051	0.0013	0.00665	0.00064

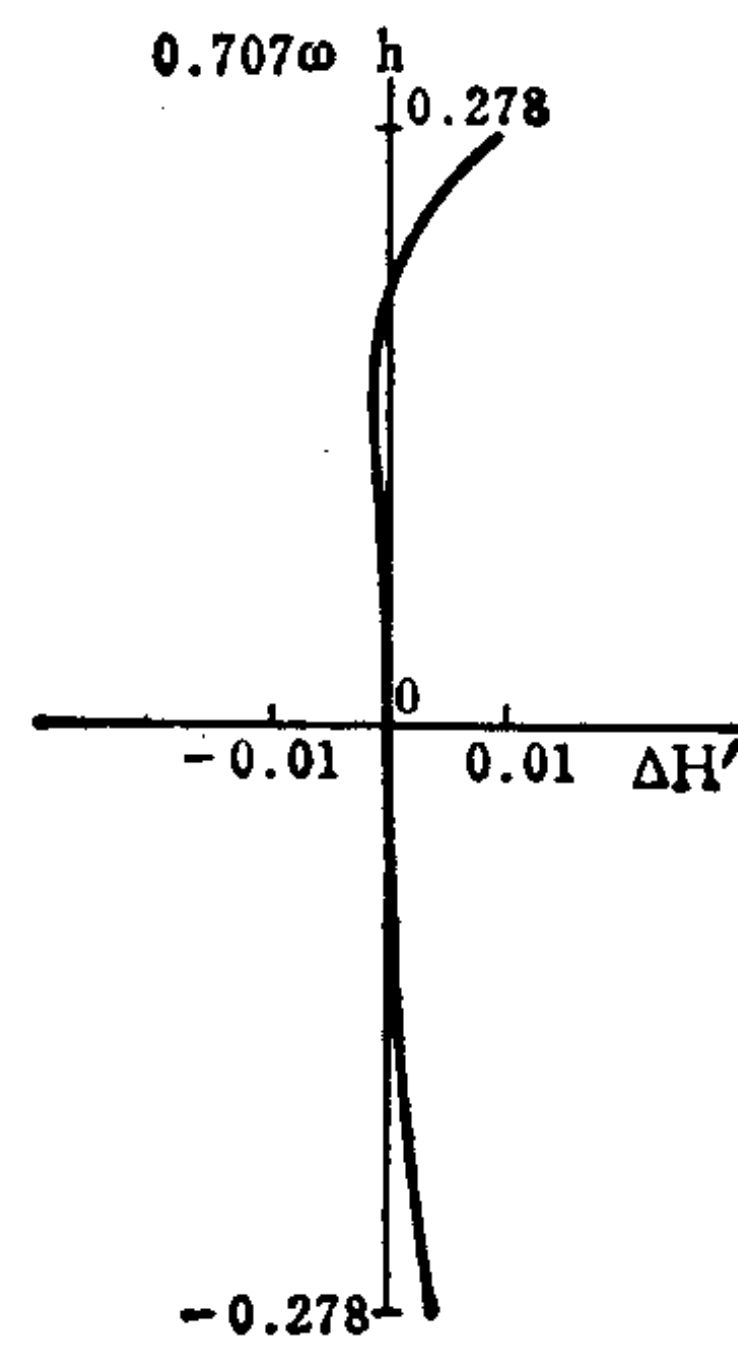
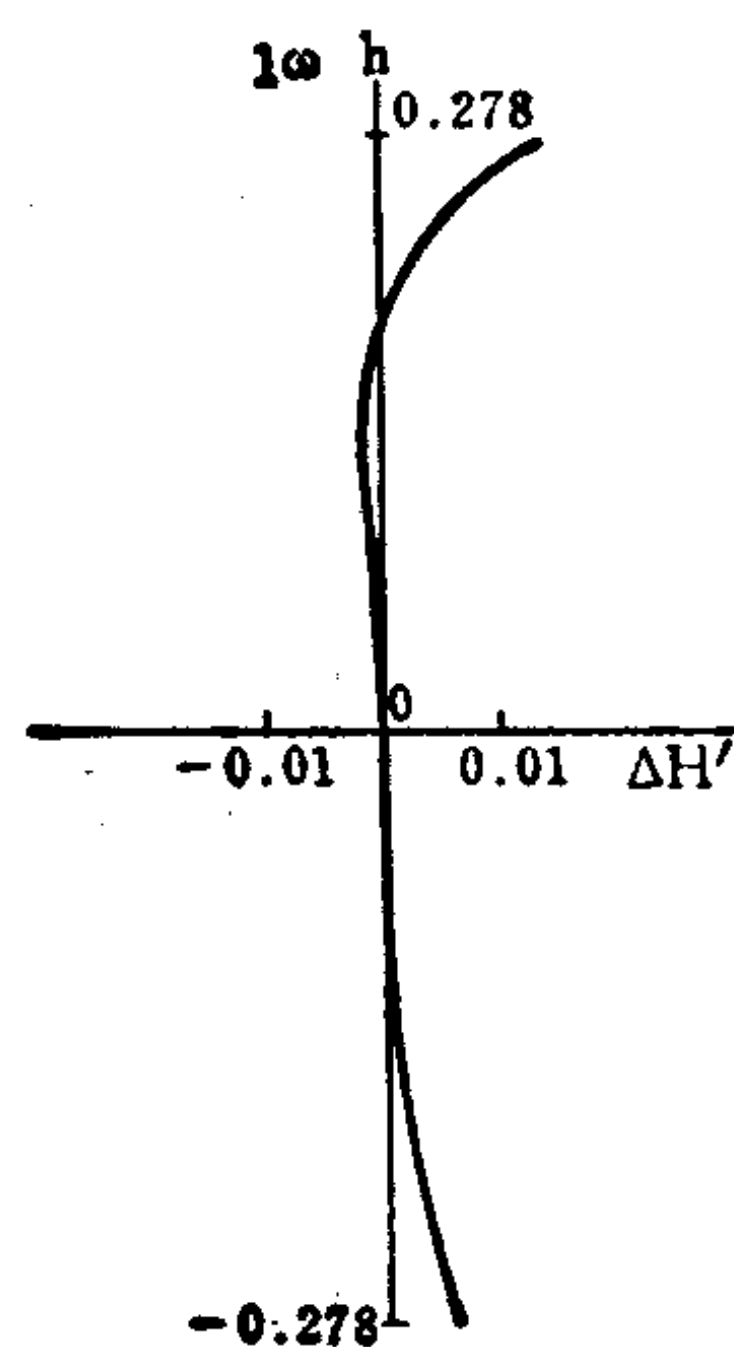
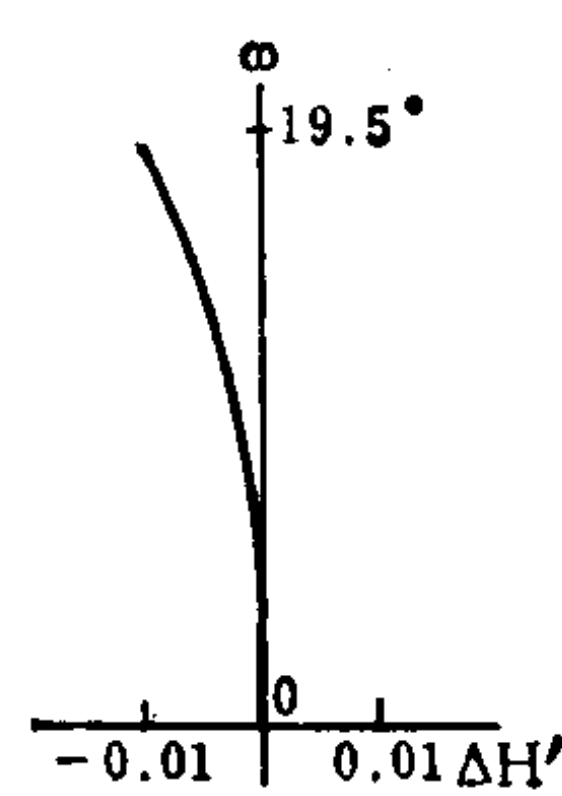
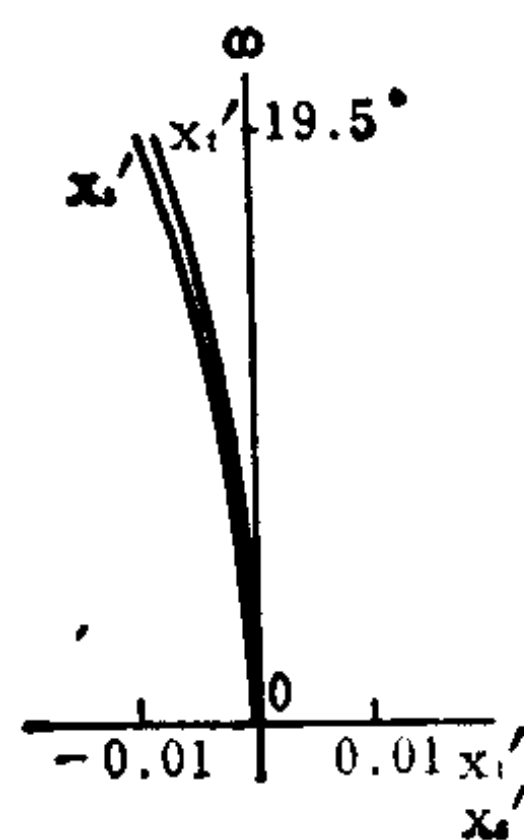
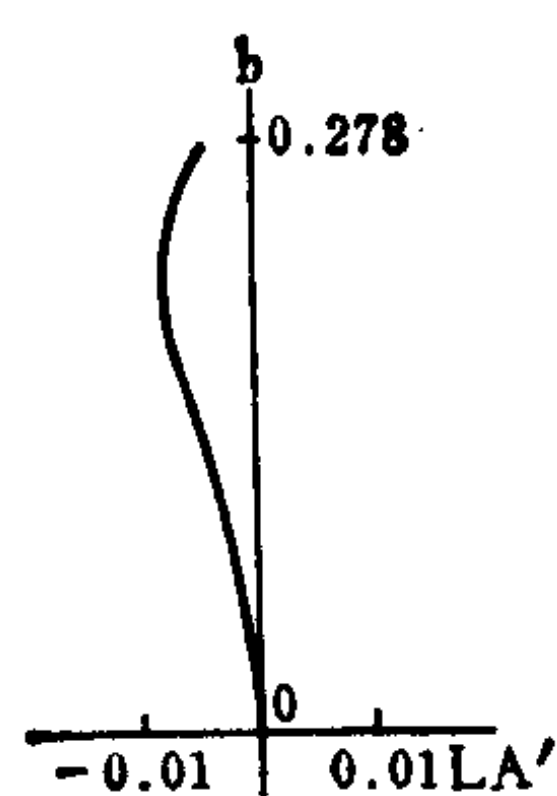
E. F. L = 1

***1 = 0.13436,

***2 = 1.70762,

***3 = 1.55990,

***3* = 1.55990 = 1.15990 + 0.40000



07-03-067-2

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1\omega)
	-0.00309	-0.00005	0.00073	-0.00186	0.00313	0.33	2.3%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00389	0.0076	-0.0059	-0.0071	0.0012	0.00547	0.00014
70	-0.00674	0.0023	-0.0012	-0.0039	0.0027	0.00514	0.00023

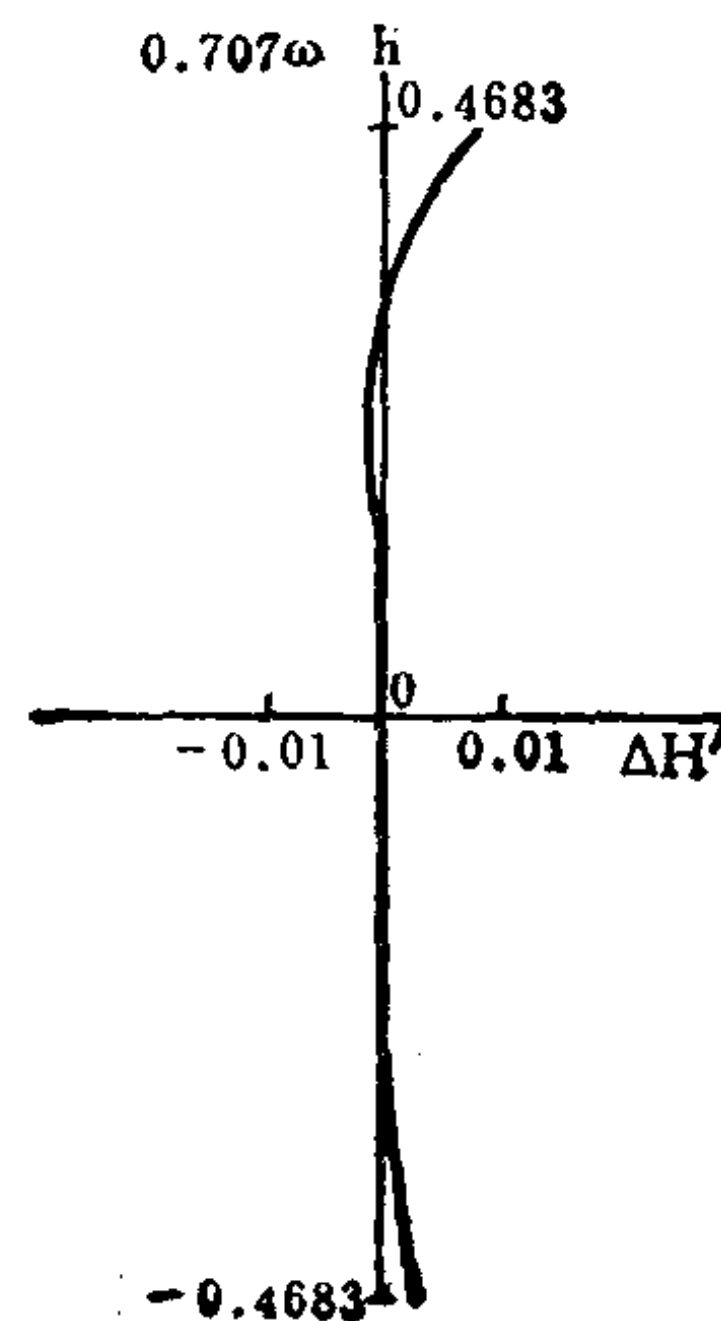
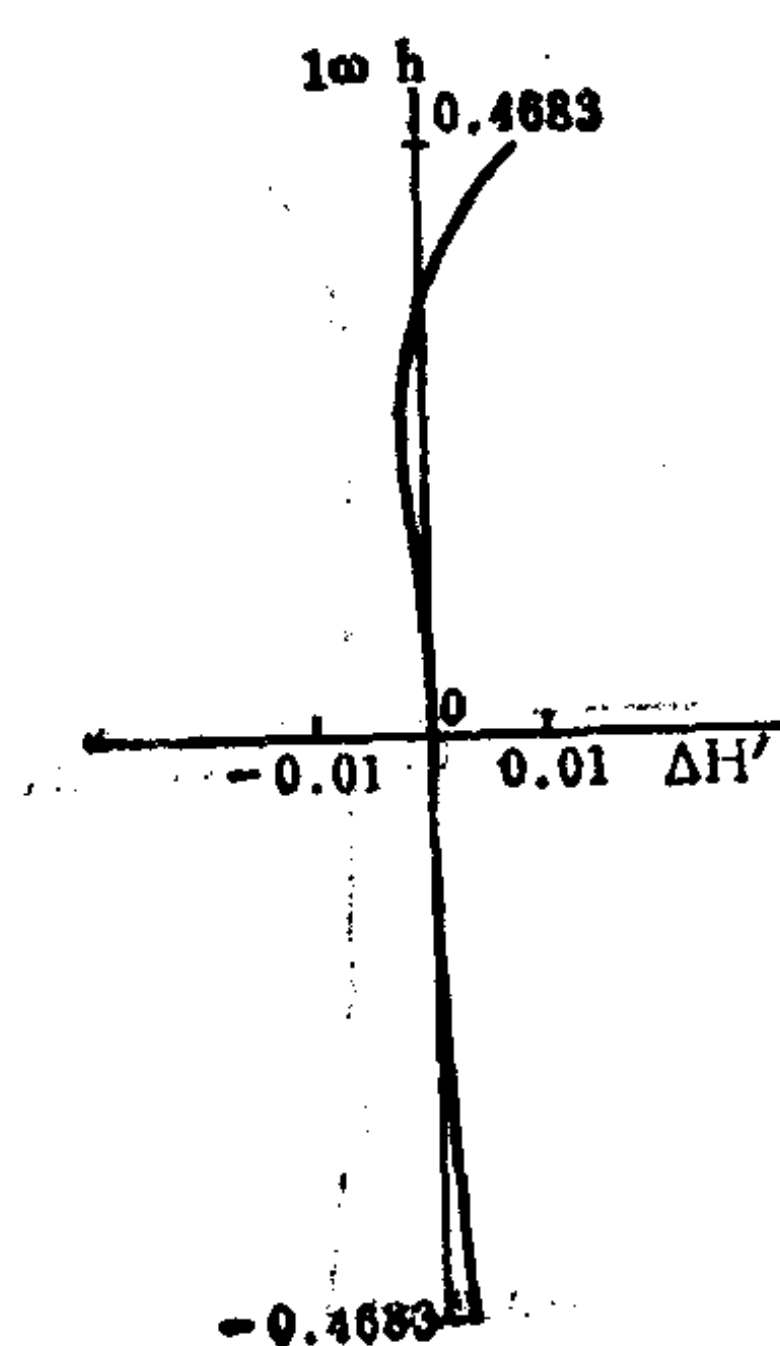
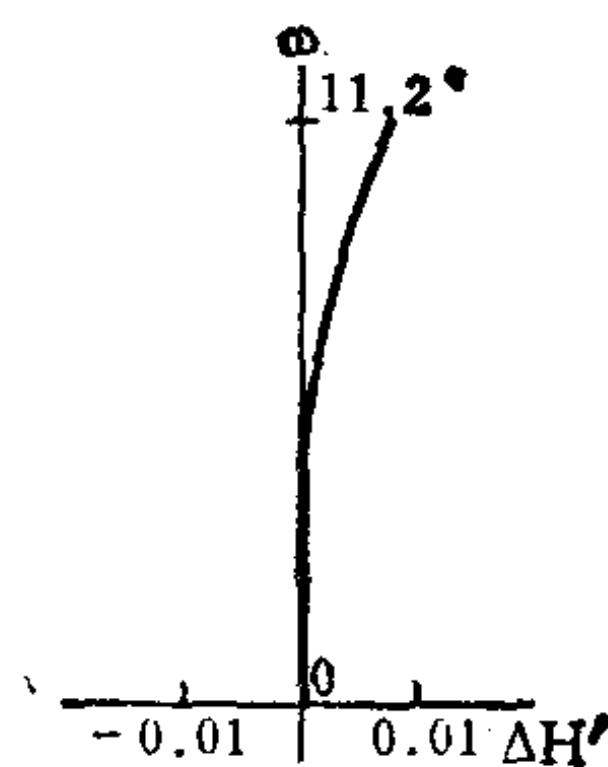
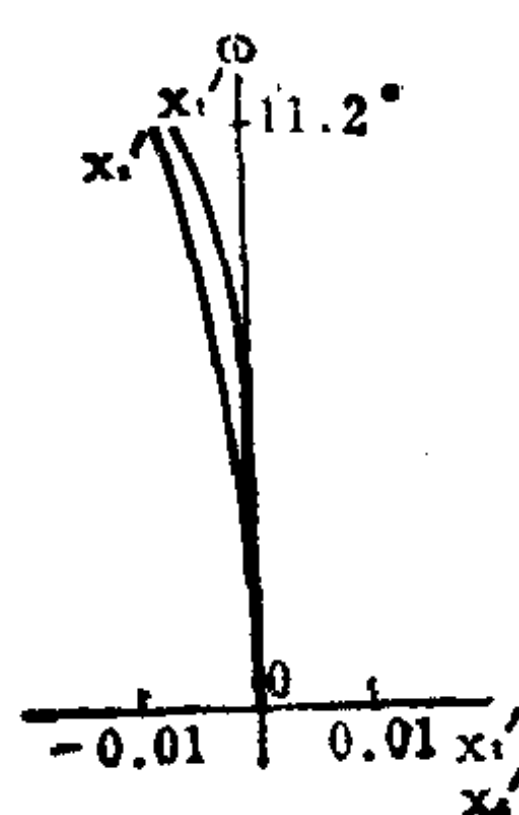
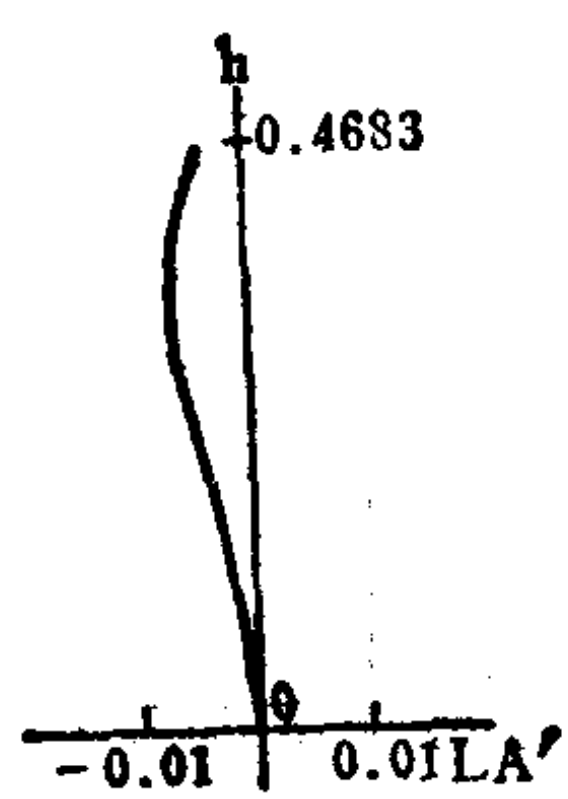
E. F. L = 1.6859

***1 = 1.12092,

***2 = 1.12483,

***3 = 1.15615,

***3* = 1.15615 = 0.75615 + 0.40000



07-03-067-3

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00302	0.00005	0.00053	-0.00181	0.00584	0.32	3.7%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K_{T1}	$K'_{T0.7}$
100	-0.00462	0.0121	-0.0086	-0.0078	-0.0008	0.00668	0.00073
70	-0.00676	0.0039	-0.0021	-0.0041	0.0020	0.00634	0.00087

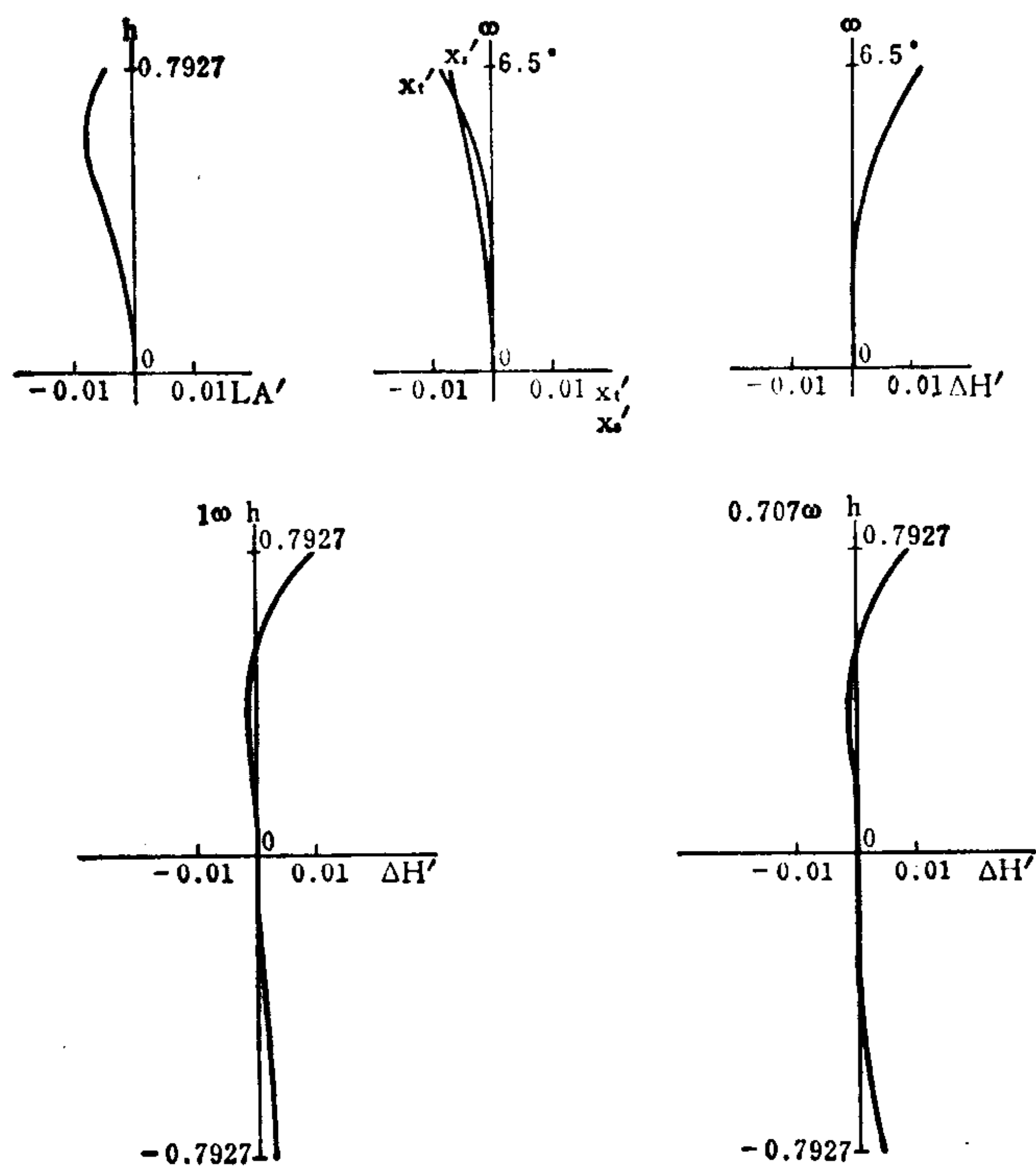
E. F. L = 2.8537

***1 = 1.70957;

***2 = 0.13241;

***3 = 1.55990;

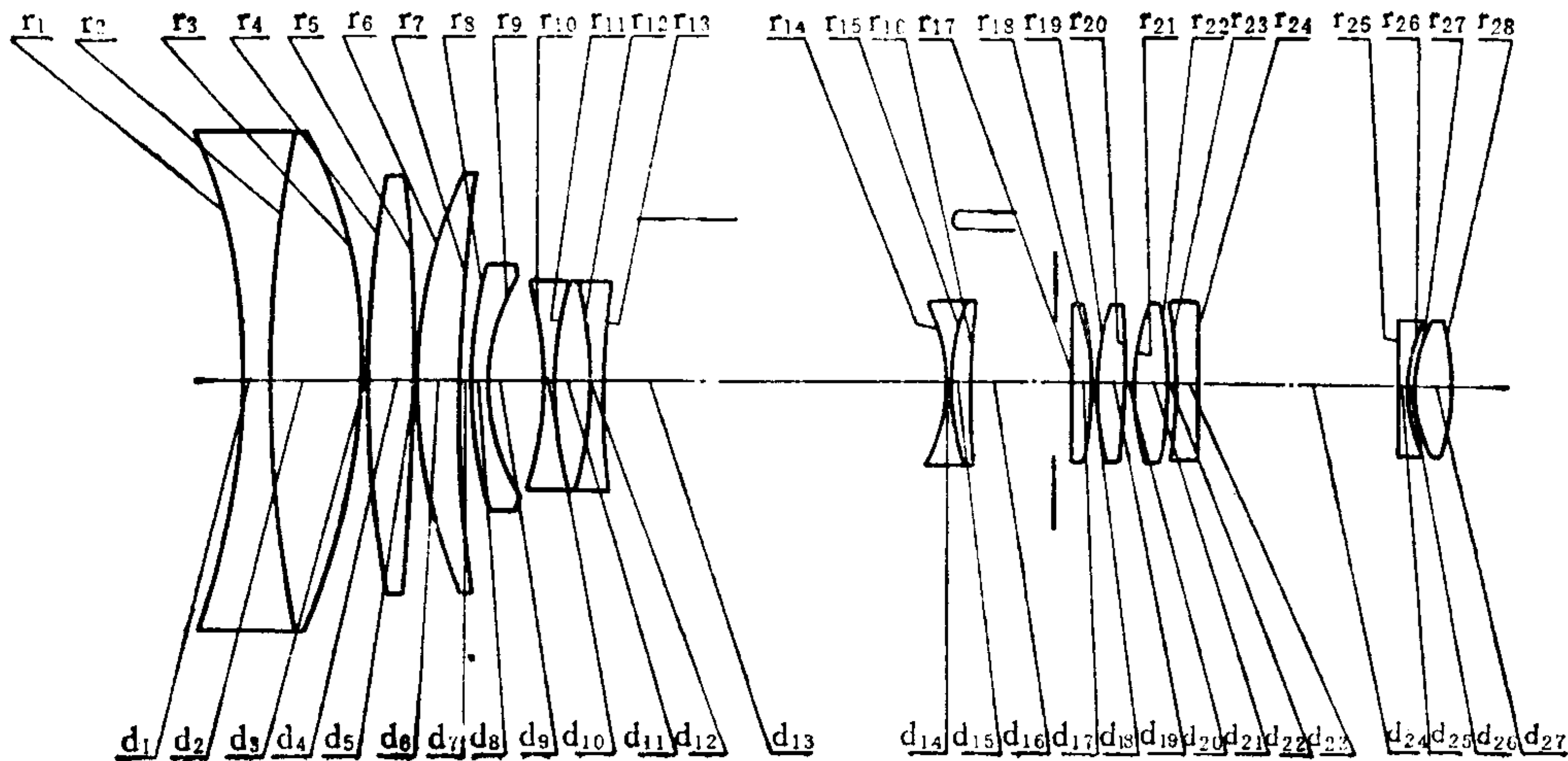
***3* = 1.55990 = 1.15990 + 0.40000



编号: 07-03-068

高变倍率等效变焦距物镜

E. F. L = 1~10 B. F. L = 2.3026 FNo. = 4 F. A. = $\pm 20.6^{\circ}$ ** ~ $\pm 2.06^{\circ}$ **



序号	r	d	n	v	序号	r	d	n	v
1	-7.2114	0.2014	1.7847	26.10	15	1.8601	0.1518	1.78470	26.10
2	12.9661	0.8928	1.51507	56.35	16	14.1274	***3*		
3	-5.8567	0.0045			17	∞	0.1911	1.52400	58.87
4	16.2336	0.3661	1.71700	47.90	18	-2.3323	0.0045		
5	-22.5012	0.0045			19	10.6292	0.1910	1.52400	58.87
6	5.6034	0.4241	1.71700	47.90	20	-10.6292	0.0045		
7	24.5154	***1			21	2.7812	0.2678	1.61342	59.27
8	3.9647	0.0804	1.69734	56.19	22	-2.7812	0.0100		
9	1.7362	0.5178			23	-2.5142	0.0893	1.72830	28.66
10	-3.9138	0.0714	1.69734	56.19	24	∞	1.8928		
11	4.4458	0.3036	1.78470	26.10	25	∞	0.0893	1.72830	28.66
12	-4.4458	0.0714	1.69734	56.19	26	1.4266	0.0298		
13	8.2572	***2			27	1.6477	0.2929	1.69734	56.19
14	-1.8601	0.0536	1.69734	56.19	28	-2.7352			

07-03-068-1

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.000356	-0.000345	-0.000226	-0.000003	-0.002452	0.37	-2.8%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00608	-0.01068	-0.0083	-0.0032	-0.0051	-0.000071	-0.000372
70	-0.00447	-0.00365	-0.0058	-0.0020	-0.0038	-0.000953	-0.000689

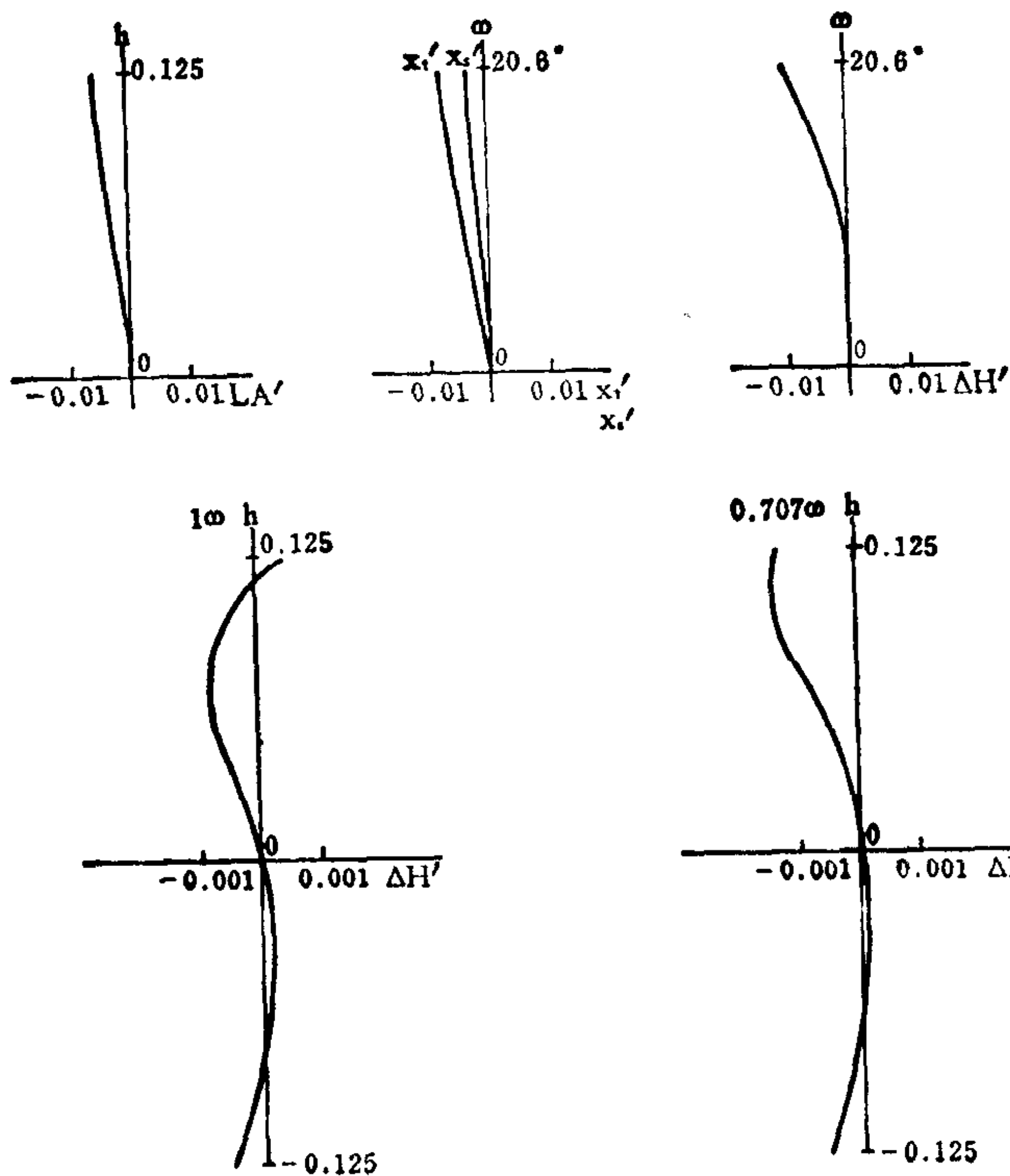
E. F. L = 1

***1 = 0.04318,

***2 = 3.63462,

***3 = 1.03190,

***3* = 1.03190 = 0.88190 + 0.15000



	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1\omega)
	- 0.000336	- 0.000159	- 0.000151	- 0.000003	0.001099	0.36	1.2%
h 或 \omega %	LA'	\Delta H'	x_t'	x_s'	x_t' - x_s'	K_{T1}'	K_{T0.7}'
100	- 0.00541	0.00463	- 0.0168	- 0.0064	- 0.0104	0.000431	- 0.000150
70	- 0.00414	0.00149	- 0.0108	- 0.0037	- 0.0071	- 0.000568	- 0.000508

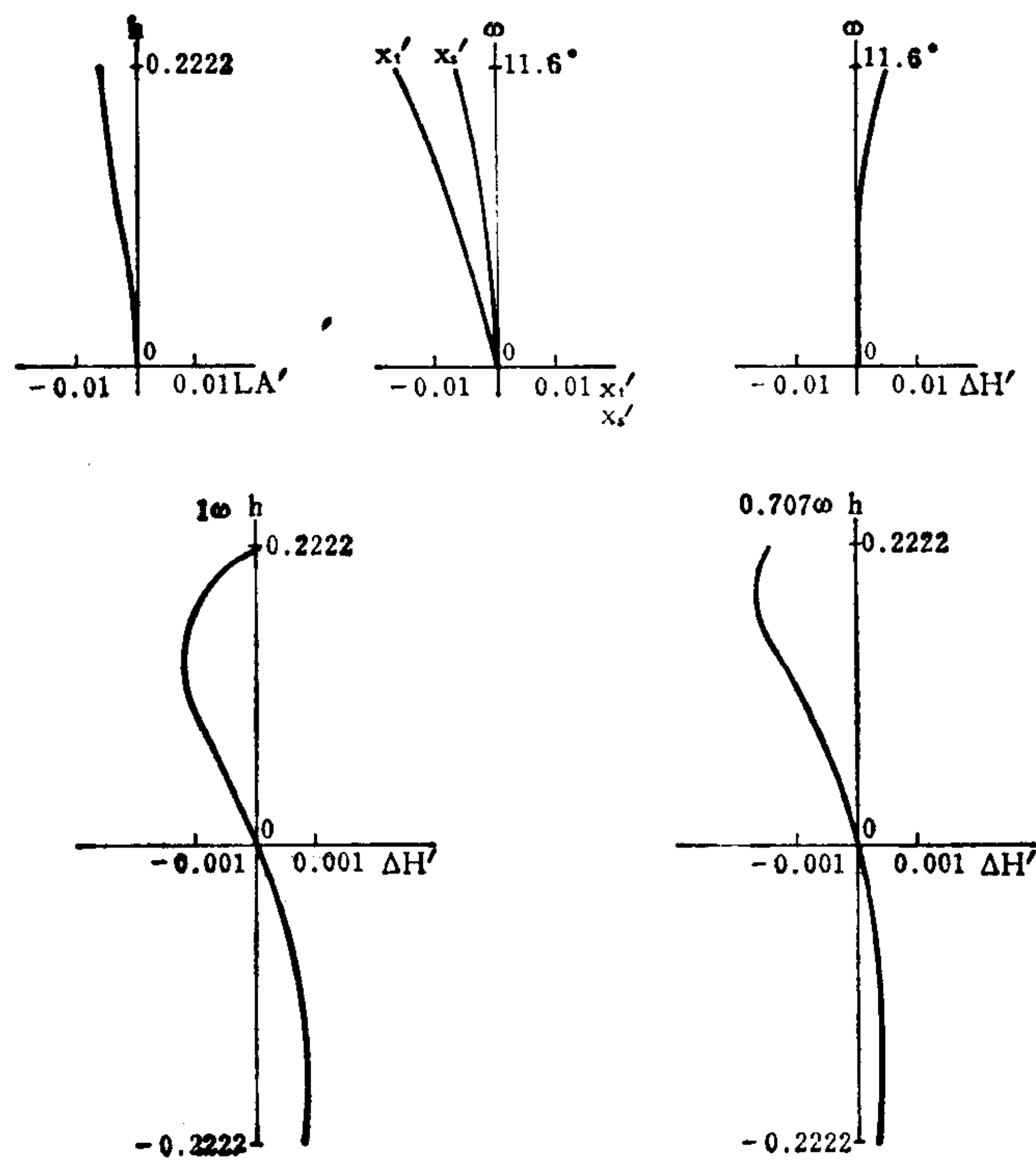
E. F. L = 1.7787

* * * 1 = 1.59156,

* * * 2 = 2.01054,

* * * 3 = 1.10760,

* * * 3* = 1.10760 = 0.95760 + 0.15000



07-03-068-3

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	- 0.000277	- 0.000120	- 0.000263	- 0.000004	0.001513	0.36	1.7%
h 或 ω %	LA'	$\Delta H'$	x'_1	x'_2	$x'_1 - x'_2$	K'_{T1}	$K'_{T0.7}$
100	- 0.00353	0.00613	- 0.0176	- 0.0070	- 0.0106	0.001207	0.000179
70	- 0.00319	0.00209	- 0.0119	- 0.0042	- 0.0077	0.000094	- 0.000196

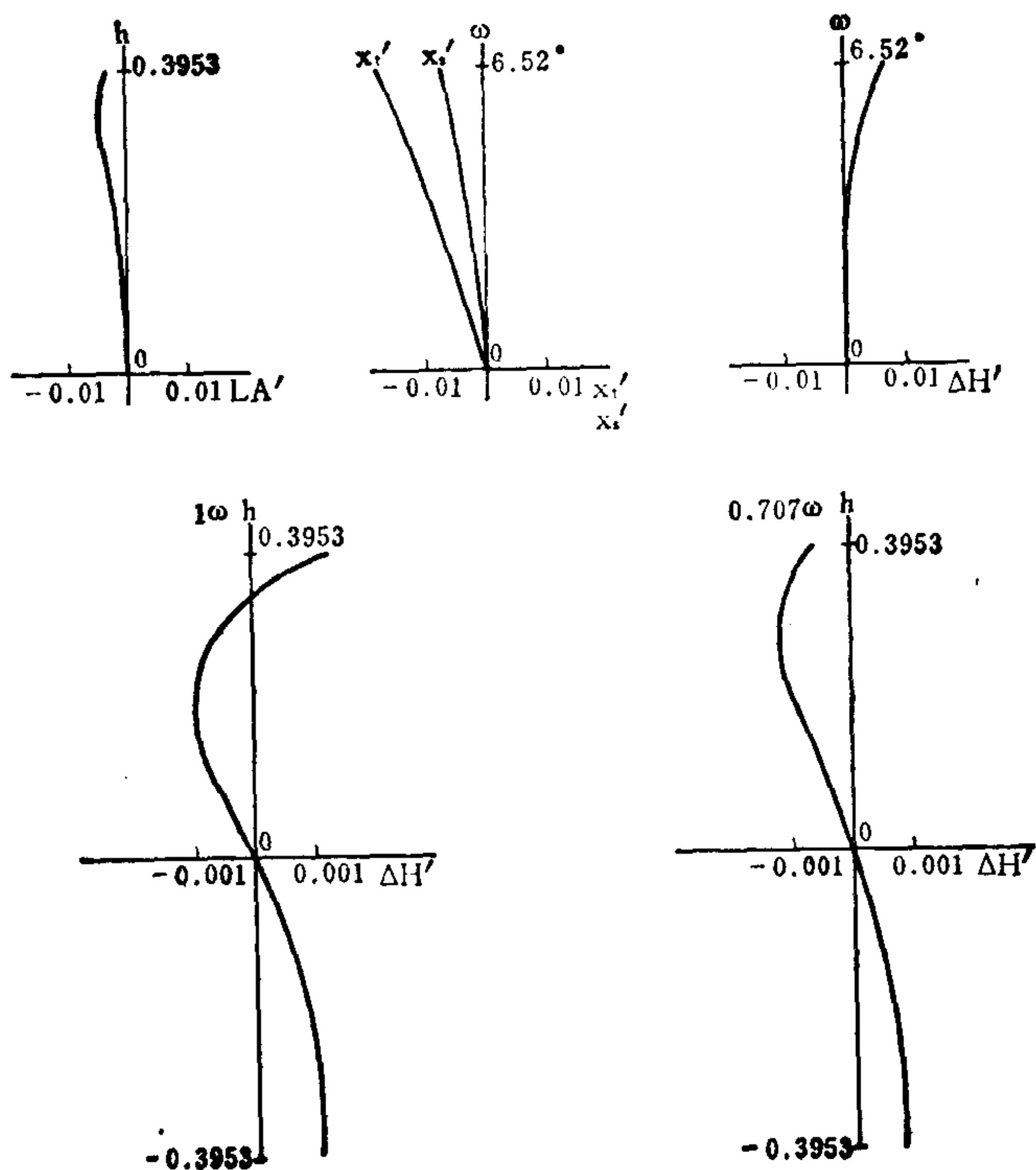
E. F. L = 3.1631

* * * 1 = 2.76329,

* * * 2 = 0.86219,

* * * 3 = 1.08422,

* * * 3* = 1.08422 = 0.93422 + 0.15000



07-03-068-4

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.000222	-0.000015	-0.000277	-0.000004	0.001457	0.36	1.6%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00204	0.00604	-0.01483	-0.00627	-0.00856	0.001859	0.000529
70	-0.00238	0.00207	-0.01081	-0.00389	-0.00692	0.000831	0.000195

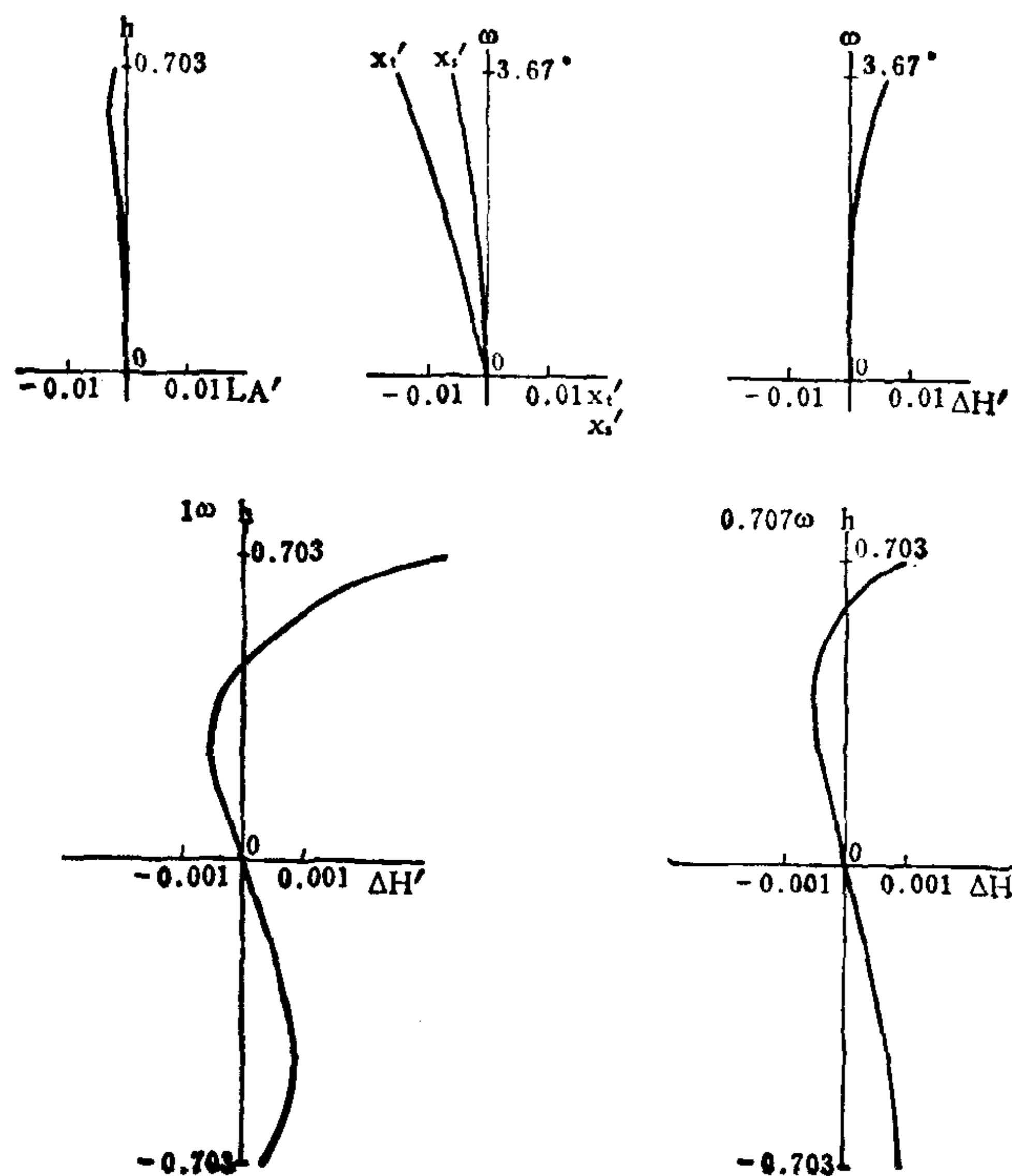
E. F. L = 5.6249

* * * 1 = 3.64395;

* * * 2 = 0.23005;

* * * 3 = 0.83569;

* * * 3* = 0.83569 = 0.68569 + 0.15000



07-03-068-5

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.000392	0.000263	-0.000478	-0.000004	0.001474	0.36	1.7%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00425	0.00620	-0.0363	-0.0130	-0.0233	0.001184	0.001024
70	-0.00431	0.00212	-0.0207	-0.0071	-0.0136	0.000887	0.000759

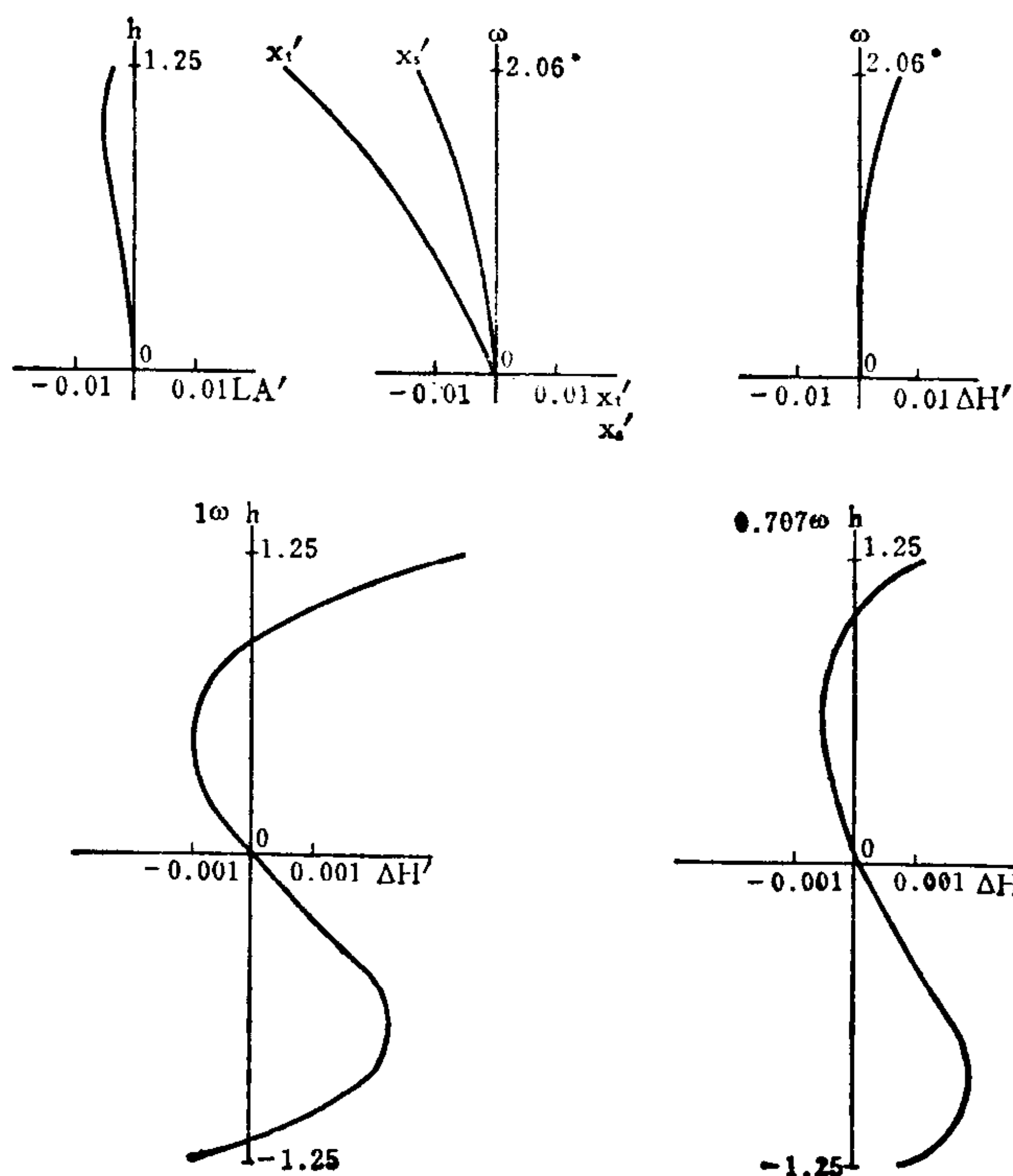
E. F. L = 10

***1 = 4.23190;

***2 = 0.23796;

***3 = 0.23984;

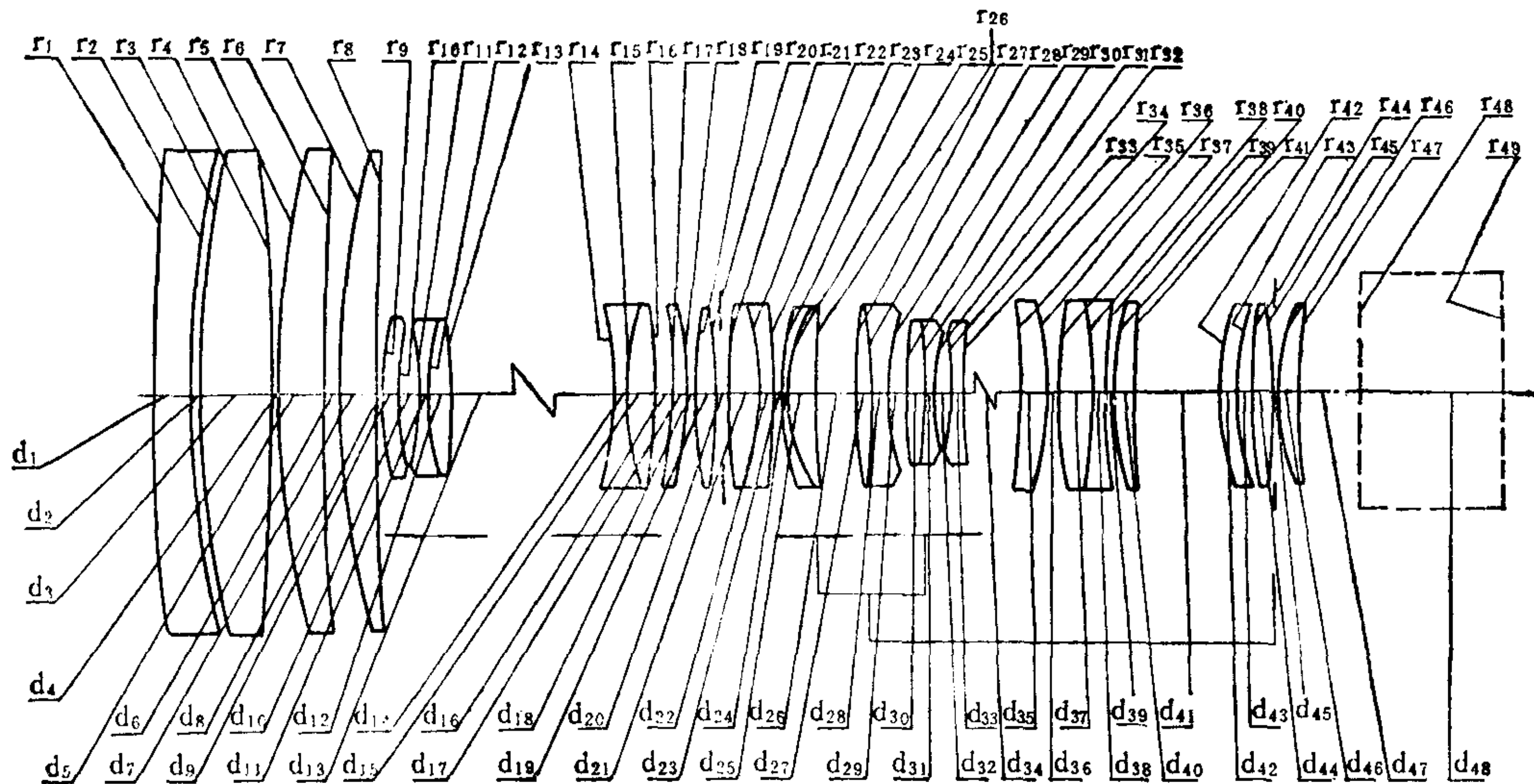
***3* = 0.23984 = 0.08984 + 0.15000



编号: 07-03-069

超高变倍率变焦距物镜

E. F. L = 24 ~ 800 B. F. L = FNo. = 1.8 ~ 4.6 F. A. = $\pm 19.1^{\circ}$ ** ~ $\pm 0.57^{\circ}$ **



序号	r	d	n	v	序号	r	d	n	v
1	1086.3900	8.000	1.75520	27.50	26	431.9450	***4		
2	283.6800	1.480			27	138.1450	5.957	1.71736	29.50
3	280.9100	23.310	1.51633	64.10	28	-633.9210	2.500	1.72000	50.30
4	-1173.2600	0.200			29	59.1800	***5		
5	289.5460	17.620	1.51633	64.10	30	123.2700	4.772	1.92286	21.00
6	1566.3700	0.200			31	-382.7700	2.500	1.81600	46.80
7	278.2680	13.270	1.51633	64.10	32	69.0452	6.815		
8	921.8920	***1			33	-74.2236	2.500	1.81600	46.80
9	364.9300	3.000	1.81600	46.80	34	413.7010	***6		
10	70.6900	9.000			35	-600.2110	7.736	1.60311	60.70
11	-87.0000	2.520	1.81600	46.80	36	-109.2490	0.200		
12	96.2450	6.000	1.92286	21.00	37	146.8290	11.823	1.60311	60.70
13	-788.2500	***2			38	-139.7300	3.000	1.80518	25.40
14	-101.8000	3.020	1.78590	44.20	39	1373.0500	0.200		
15	100.0800	10.000	1.80518	25.40	40	129.3180	7.872	1.60311	60.70
16	-3088.0000	***3			41	1539.5200	29.808		
17	-2040.0000	6.000	1.48749	70.10	42	110.4320	3.000	1.71736	29.50
18	-104.1800	0.200			43	70.8992	6.566		
19	261.6900	6.500	1.48749	70.10	44	162.8080	6.778	1.51633	64.10
20	-200.3300	3.511			45	-360.1620	0.200		
21	234.5810	12.782	1.60311	60.70	46	79.4534	7.974	1.51633	64.10
22	-88.1214	3.500	1.80518	25.40	47	652.0880	20.000		
23	-289.9800	0.200			48	∞	69.200	1.51633	64.10
24	79.5181	3.000	1.75520	27.50	49	∞			
25	54.7653	10.476	1.62041	60.30					

E. F. L = 24 ~ 234.2 ~ 800

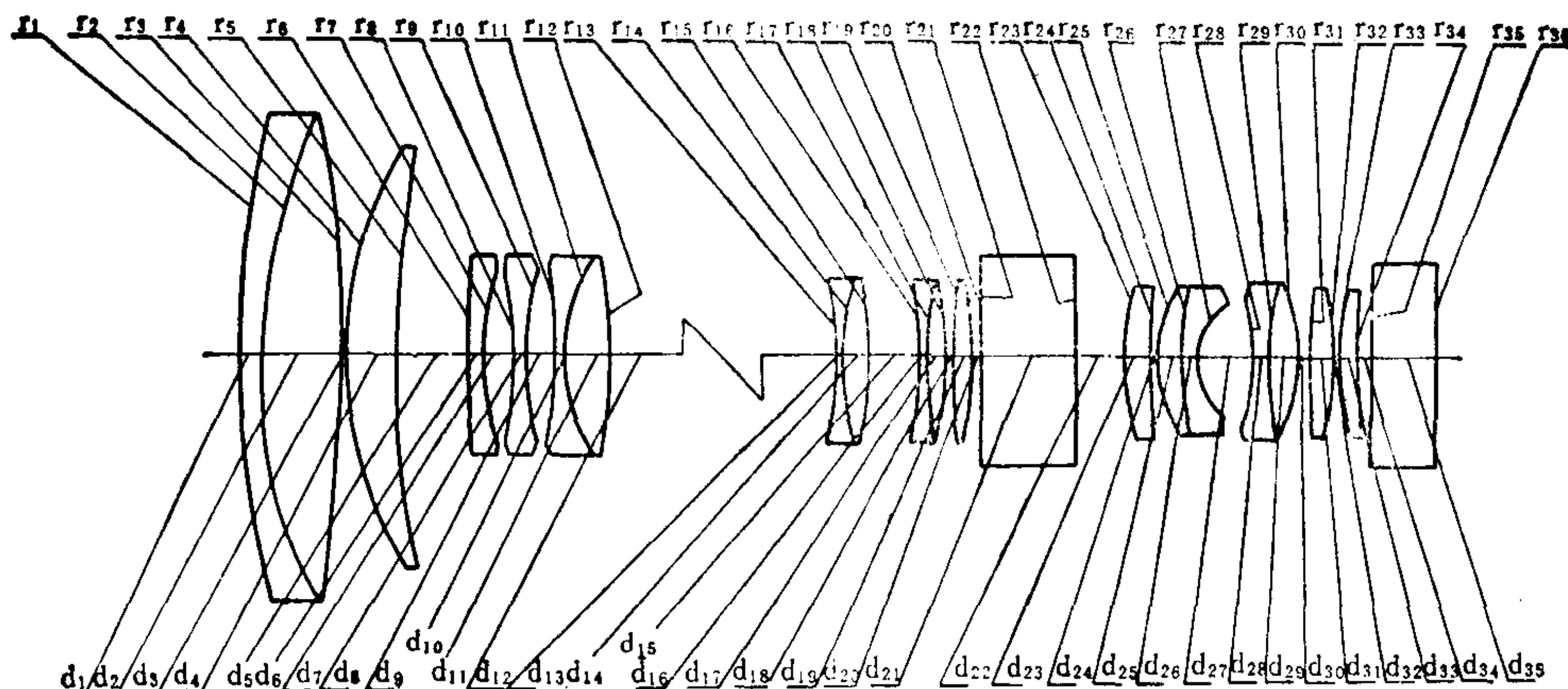
***1 = 0.5517	183.9580	228.8850
***2 = 235.6810	29.5934	7.3484
***3 = 5.9945	28.6778	5.9945
***4 = 13.1102	17.6795	16.5754
***5 = 7.1707	26.2014	43.7055
***6 = 42.8562	19.2562	2.8562

变倍比 1:33.3

编号: 07-03-070

大孔径高变倍率变焦距物镜

E. F. L = 7.5 ~ 60 B. F. L = $F_{No.} = 1.4$ F. A. = $\pm 27.5^{\circ} ** \sim \pm 3.44^{\circ} **$



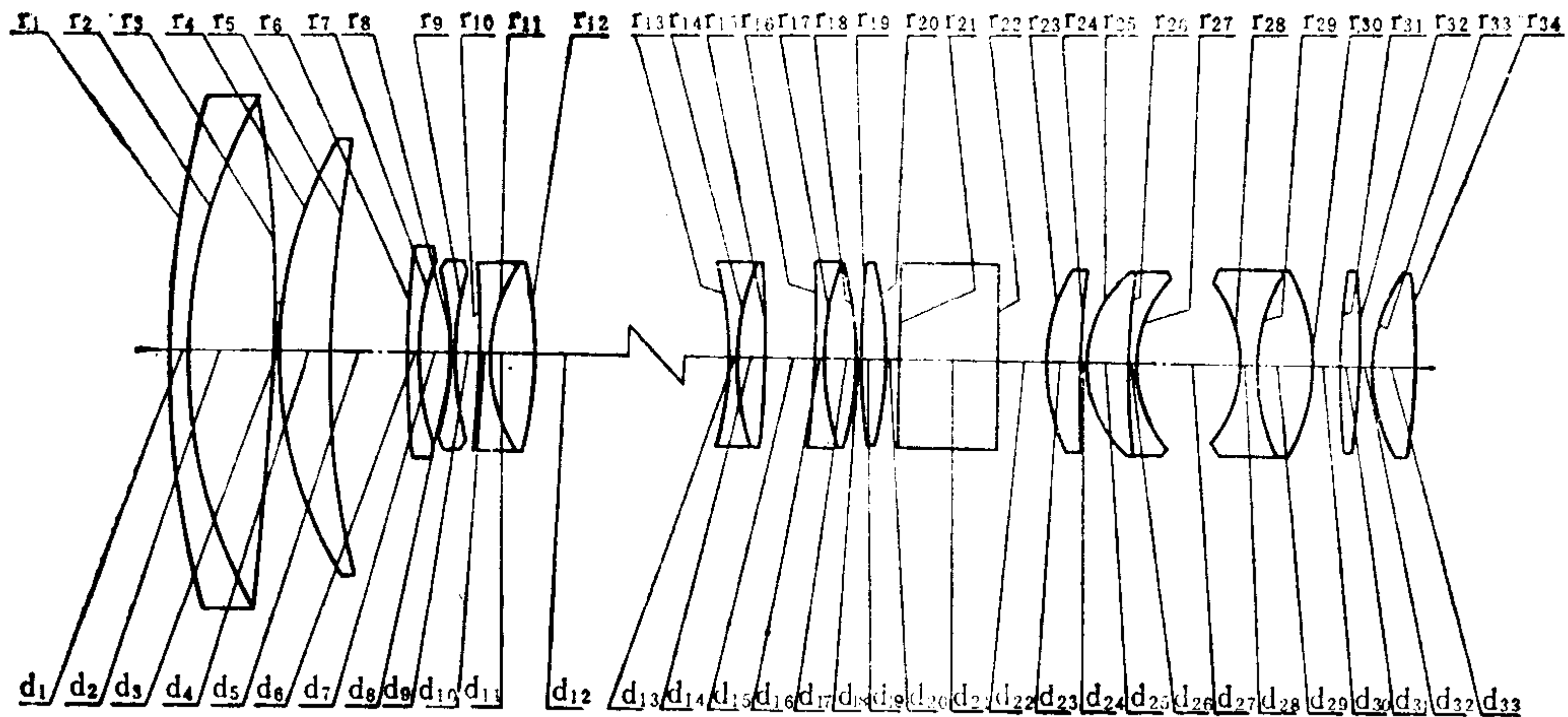
序号	r	d	n	v	序号	r	d	n	v
1	131.918	1.72	1.80518	25.4	19	224.854	1.50	1.64000	60.2
2	55.365	8.50	1.64000	60.2	20	-59.960	0.70		
3	-198.061	0.10			21	∞	11.00	1.63854	55.4
4	43.354	5.00	1.64000	60.2	22	∞	5.50		
5	94.875	***1			23	21.700	3.15	1.75700	47.9
6	104.043	0.70	1.71300	54.0	24	65.650	0.10		
7	19.844	3.20			25	11.500	3.88	1.71300	54.0
8	-38.740	0.70	1.77250	49.6	26	36.000	1.59	1.80518	25.4
9	36.985	2.30			27	8.130	6.29		
10	-101.786	0.70	1.72342	38.0	28	-13.800	1.72	1.78470	26.2
11	16.543	4.50	1.78470	26.2	29	49.460	3.90	1.67790	53.3
12	-72.304	***2			30	-18.660	1.76		
13	-27.427	0.60	1.78590	44.2	31	137.390	2.36	1.66446	35.8
14	24.284	2.50	1.75520	27.5	32	-31.920	0.10		
15	-199.487	***3			33	21.420	1.80	1.59270	35.6
16	-319.952	0.60	1.69895	30.1	34	1051.429	1.20		
17	276.454	2.50	1.69680	55.7	35	∞	6.80	1.63854	55.4
18	-33.288	0.10			36	∞			

E. F. L = 7.5 ~ 25 ~ 60
 ***1 = 8.27415 36.29100 46.96344
 ***2 = 50.01980 18.88531 11.71152
 ***3 = 5.97179 9.08944 5.59079
 变倍比 1:8
 $f_I = 68.7$ ($r_1 \sim r_5$)
 $f_{II} = -16.2$ ($r_6 \sim r_{12}$)
 $f_{III} = -38.5$ ($r_{13} \sim r_{15}$)
 $f_{IV} = 31.1$ ($r_{16} \sim r_{22}$)
 $f_V = 26.6$ ($r_{23} \sim r_{36}$)

编号: 07-03-071

大孔径高变倍率变焦距物镜

E.F.L=7.5~60 B.F.L= FNo.=1.4 F.A.= $\pm 27.5^{\circ}$ **~ $\pm 3.44^{\circ}$ **



序号	r	d	n	v	序号	r	d	n	v
1	128.457	1.72	1.80518	25.4	18	-33.322	0.10		
2	54.760	8.50	1.64000	60.2	19	260.325	1.50	1.64000	60.2
3	-195.445	0.10			20	-58.944	0.70		
4	43.667	5.00	1.64000	60.2	21	∞	11.00	1.63854	55.4
5	93.917	***1			22	∞	5.50		
6	103.965	0.70	1.71300	54.0	23	24.095	3.15	1.75700	47.9
7	19.729	3.20			24	84.060	0.10		
8	-39.198	0.70	1.77250	49.6	25	12.448	4.30	1.71300	54.0
9	37.675	2.30			26	41.129	1.59	1.80518	25.4
10	-96.497	0.70	1.72342	38.0	27	8.827	11.12		
11	16.418	4.50	1.78470	26.2	28	-12.900	1.72	1.78470	26.2
12	-72.239	***2			29	20.993	5.98	1.67790	53.3
13	-27.536	0.60	1.78590	44.2	30	-18.011	1.76		
14	24.562	2.50	1.75520	27.5	31	47.998	2.36	1.66446	35.8
15	-206.054	***3			32	-45.738	0.10		
16	-360.023	0.60	1.69895	30.1	33	19.233	3.75	1.59270	35.6
17	278.930	2.50	1.69680	55.7	34	-567.303			

E.F.L=7.5 ~ 25 ~ 60
 ***1=8.27415 36.29100 46.96344
 ***2=50.01980 18.88531 11.71152
 ***3=5.97179 9.08944 5.59079
 变倍比 1:8
 $f_I = 68.7$ ($r_1 \sim r_5$)
 $f_{II} = -16.2$ ($r_6 \sim r_{12}$)
 $f_{III} = -38.5$ ($r_{13} \sim r_{15}$)
 $f_{IV} = 31.1$ ($r_{16} \sim r_{22}$)
 $f_V = 26.6$ ($r_{23} \sim r_{34}$)

编号: 07-04-072

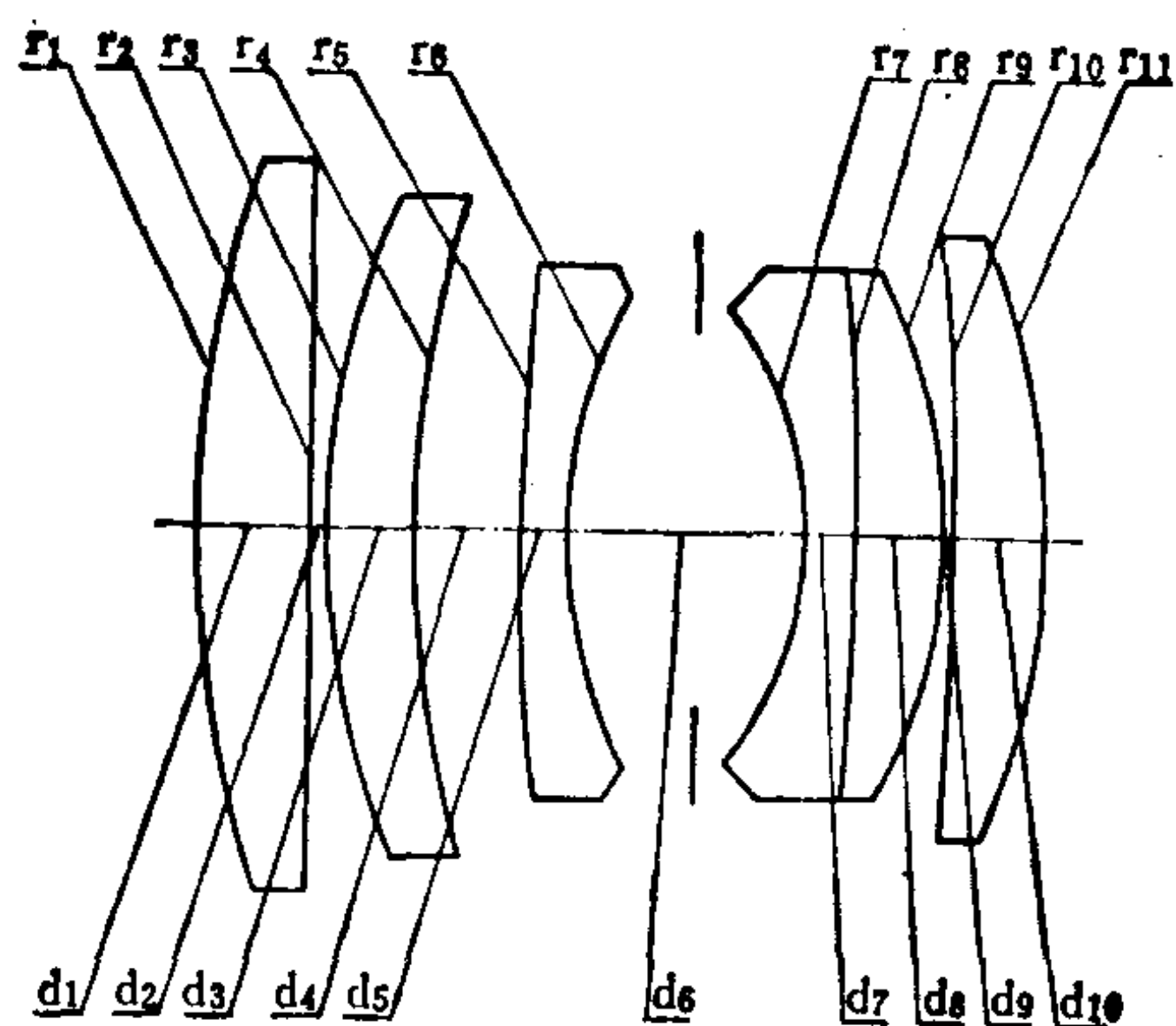
明 亮 的 投 影 物 镜

E.F.L = 100

B.F.L = 144.6

NA = 0.06

$\eta = 94.03$

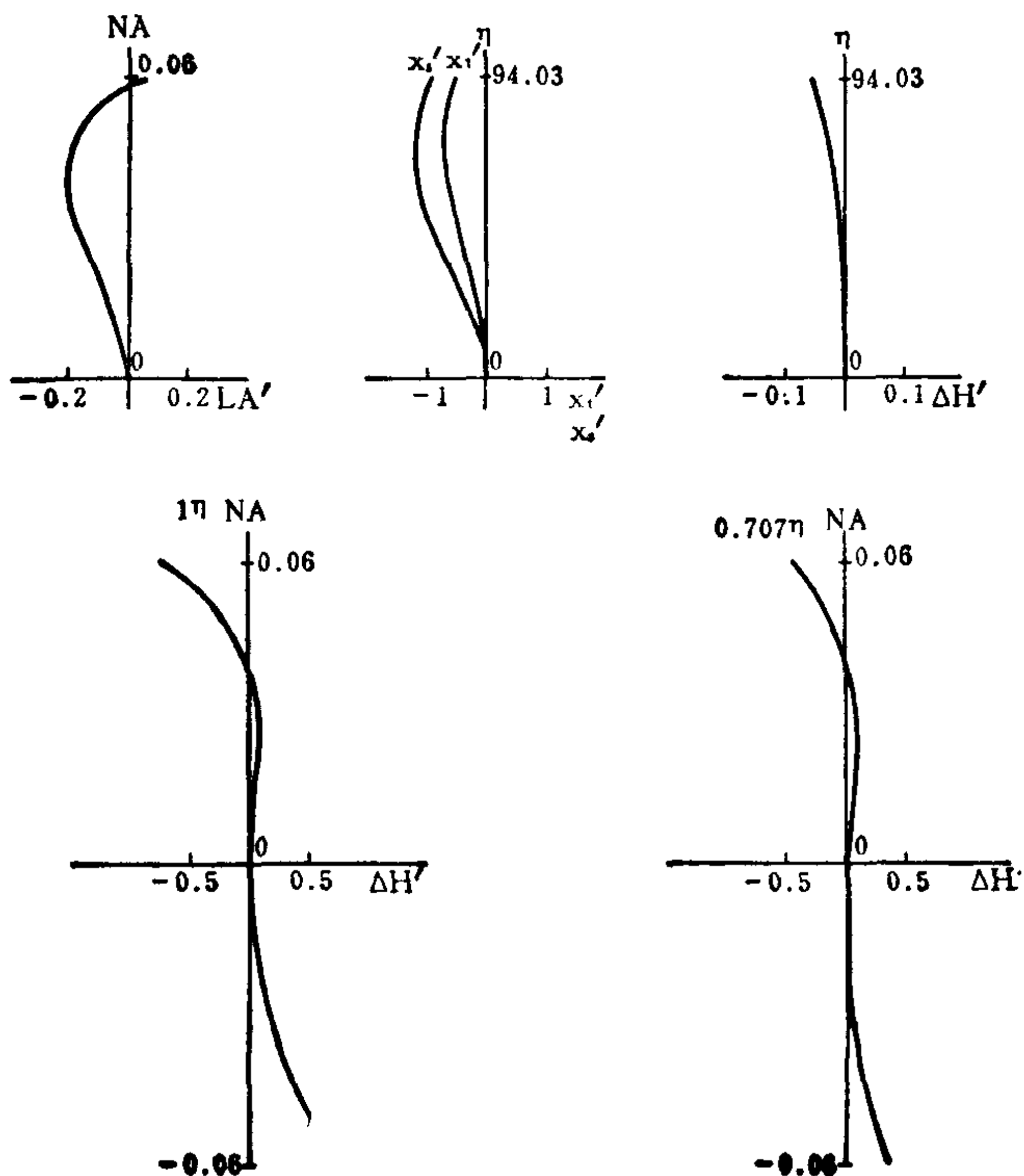


序号	r	d	n	v	序号	r	d	n	v
1	65.7827	6.314	1.63854	55.38	7	-22.1345	3.372	1.57501	41.49
2	∞	0.537			8	-133.3642	5.051	1.67790	55.33
3	45.4964	5.424	1.63854	55.38	9	-32.6426	0.202		
4	80.8231	6.106			10	-367.2337	5.051	1.63854	55.38
5	196.5133	3.227	1.71736	29.51	11	-47.6287			
6	34.5551	13.562*							

$$13.562^* = 6.781 + 6.781$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 η)
	-0.01309	-0.01473	0.00874	-0.06761	0.00633	63	-0.08%
NA或 η %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.0714	-0.0506	-0.457	-0.917	0.460	-0.0218	0.1512
70	-0.2012	-0.0212	-0.638	-1.229	0.591	-0.0676	0.0678

注: 以上象差值是在 $l = -216.396$ 、 $\eta = 94.03$ 、 $M = -0.67^*$ 及 $F/3.3$ (NA = 0.06) 时计算的。



编号: 07-04-073

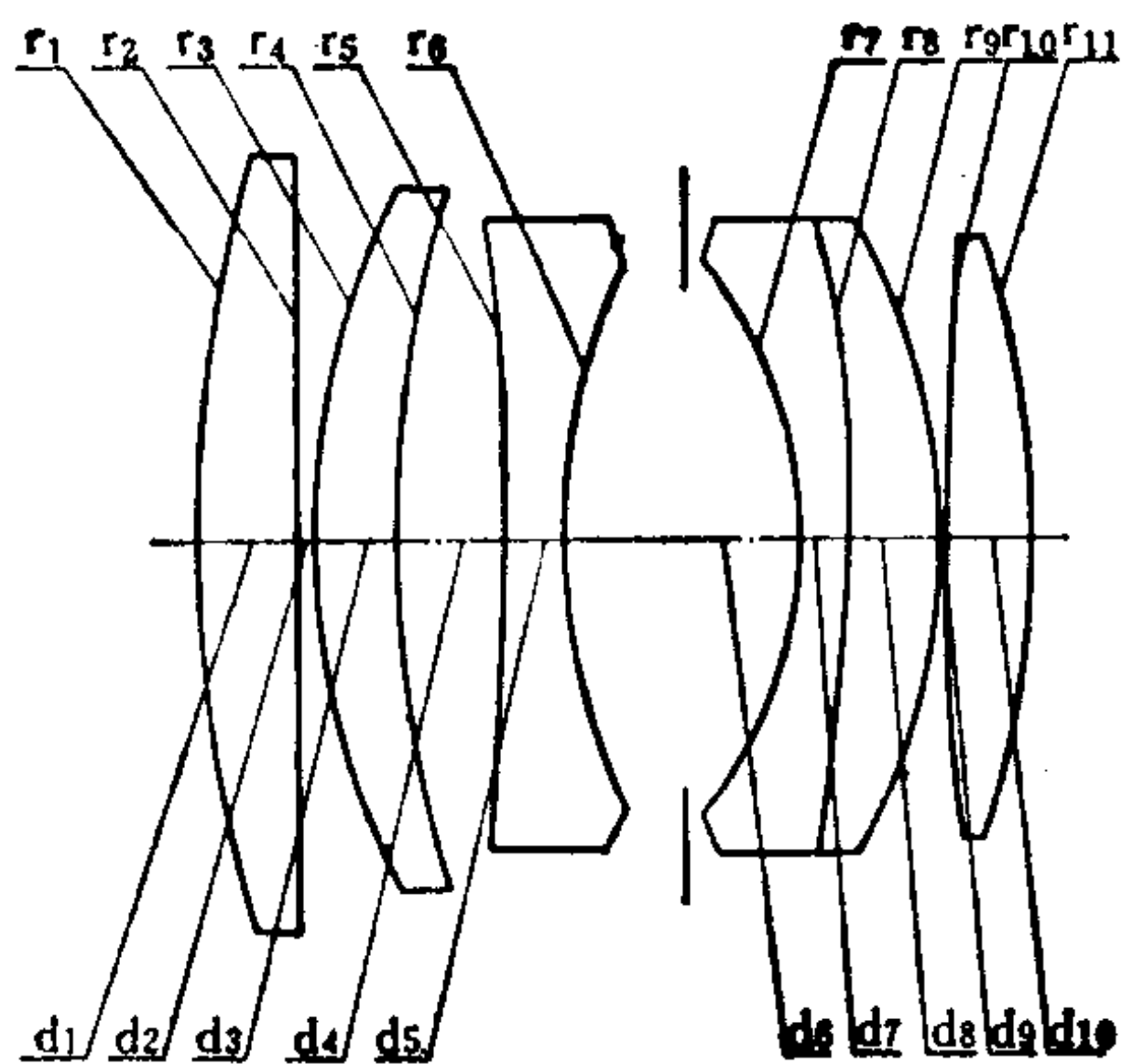
明 亮 的 投 影 物 镜

E.F.L = 100

B.F.L = 150.2

NA = 0.06

$\eta = 94.45$

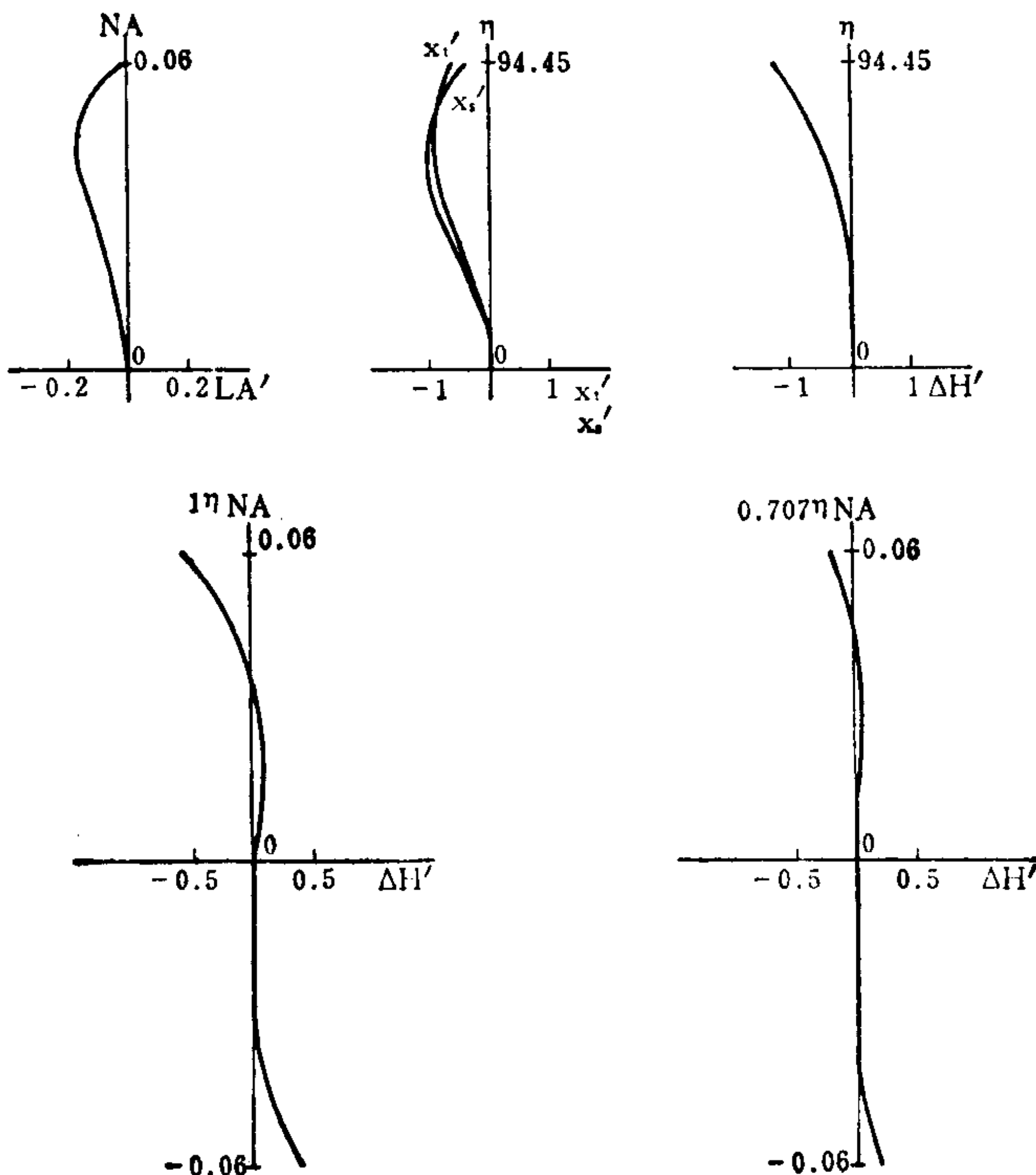


序号	r	d	n	v	序号	r	d	n	v
1	78.2149	6.166	1.63854	55.38	7	-25.2312	3.293	1.59270	35.29
2	∞	0.524			8	-96.8018	4.933	1.67790	55.33
3	44.2423	5.296	1.63854	55.38	9	-36.0128	0.197		
4	89.4897	5.962			10	1453.4430	4.933	1.63854	55.38
5	-578.8580	3.121	1.59270	35.29	11	-49.6763			
6	34.1778	13.244*							

13.244* = 6.622 + 6.622

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 η)
	-0.00945	-0.00069	0.00484	-0.06053	0.16781	63	-2%
NA或 η %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{f1}	$K'_{T0.7}$
100	-0.0182	-1.297	-0.691	-0.438	-0.253	-0.1045	-0.0053
70	-0.1572	-0.434	-0.880	-1.082	0.202	-0.0009	0.0079

注: 以上象差值是在 $l = -214.398$ 、 $\eta = 94.45$ 、 $M = -0.667^*$ 及 $F/3.3$ (NA = 0.06) 时计算的。



编号: 07-04-074

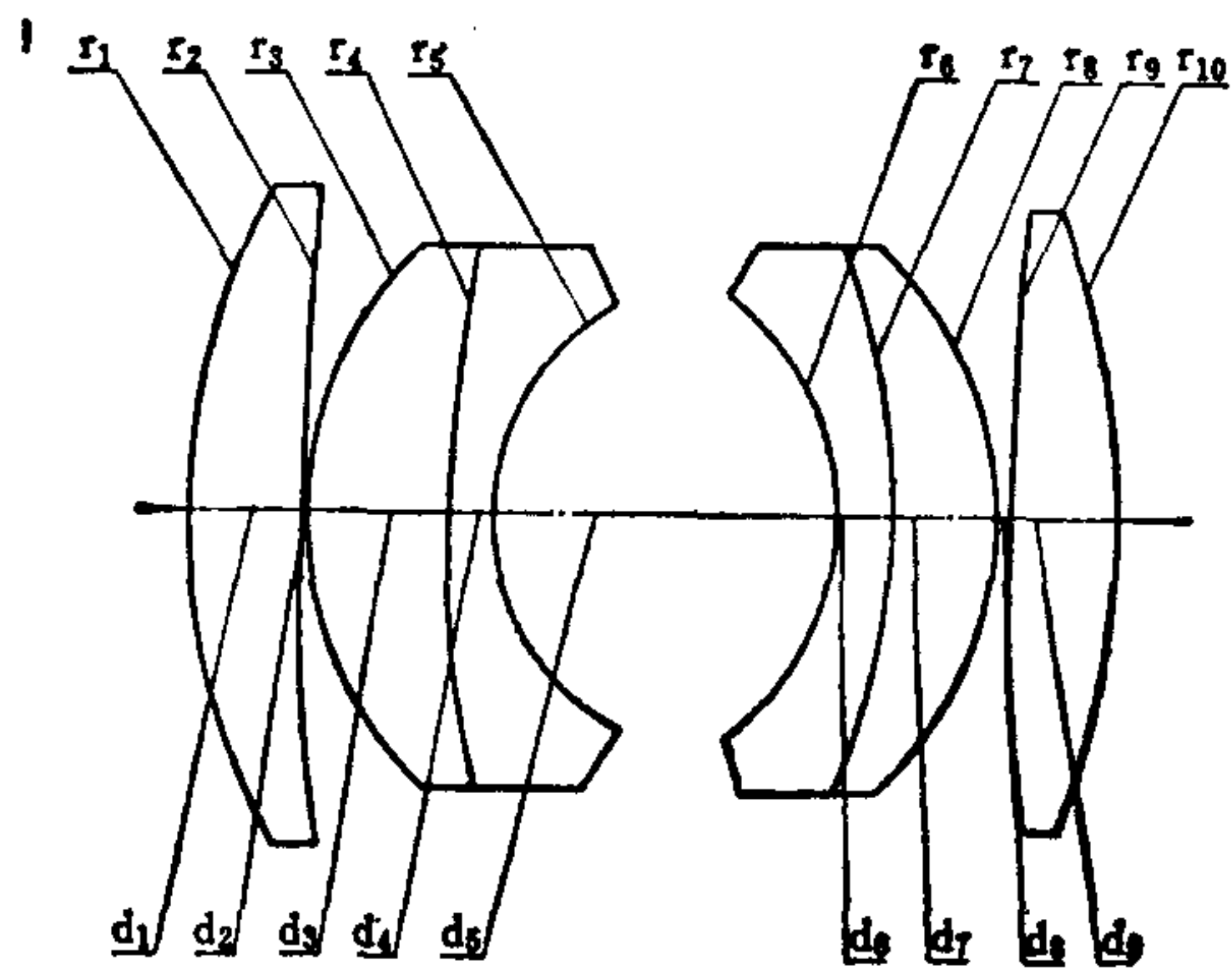
投 影 物 镜

E.F.L=99.95

B.F.L=55.20

FNo.=2.8

F.A.=±15°

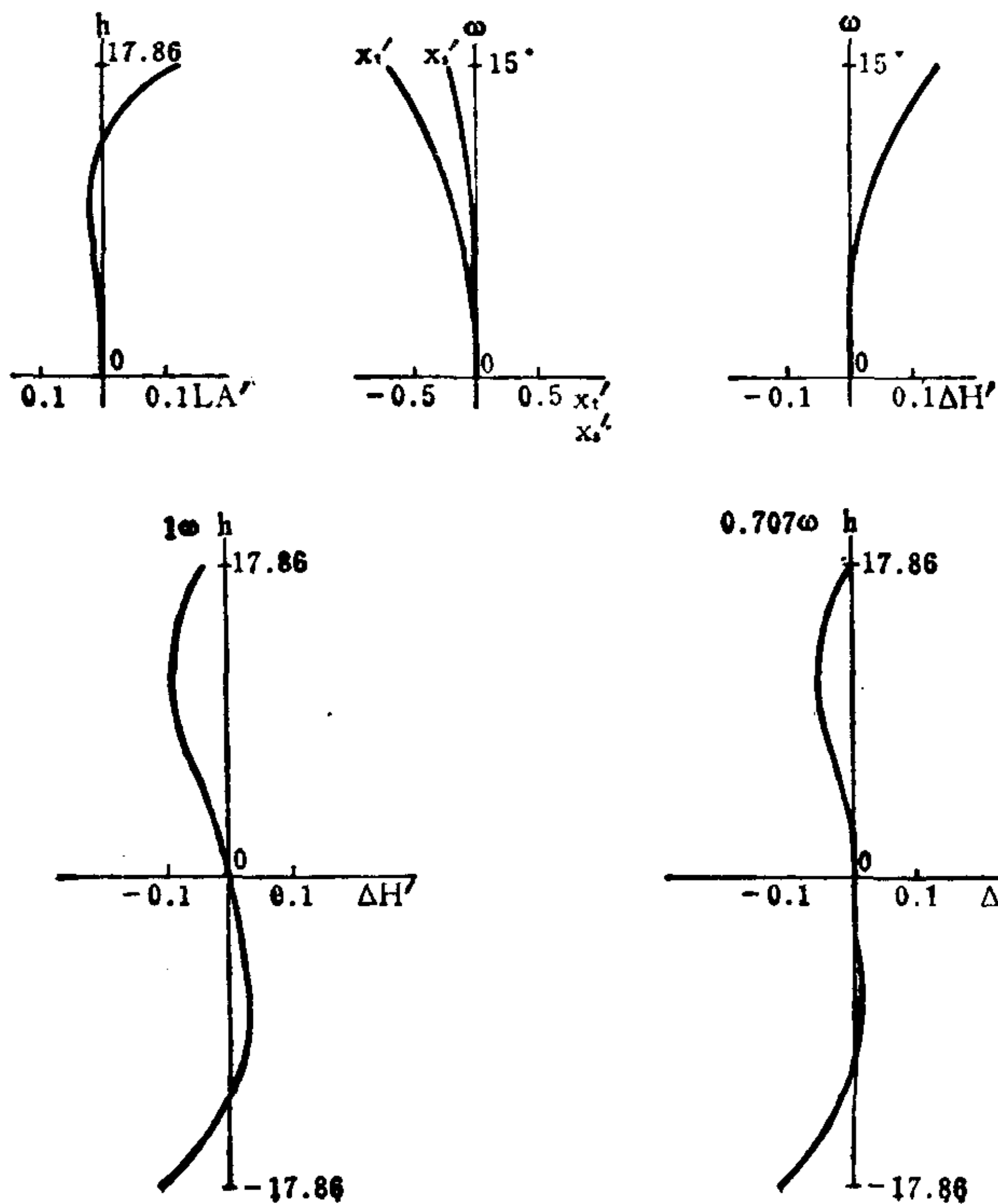


序号	r	d	n	v	序号	r	d	n	v
1	62.044	8.750	1.6385	55.4	6	-23.891	3.750	1.5920	35.3
2	202.730	0.625			7	-91.430	9.375	1.6400	60.3
3	32.553	12.500	1.6780	55.3	8	-31.498	0.625		
4	121.361	3.750	1.6400	34.6	9	569.833	8.750	1.6520	58.7
5	20.575	28.750*			10	-69.590			

28.750* = 14.375 + 14.375

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00969	-0.01246	-0.00503	-0.01421	0.04948	26.7	0.5%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.1373	0.1458	-0.719	-0.212	-0.507	-0.0773	-0.0456
70	-0.0094	0.0505	-0.303	-0.134	-0.169	-0.0571	-0.0334

注: 以上象差值是按 $l = -\infty$ 计算的。



编号: 07-04-075

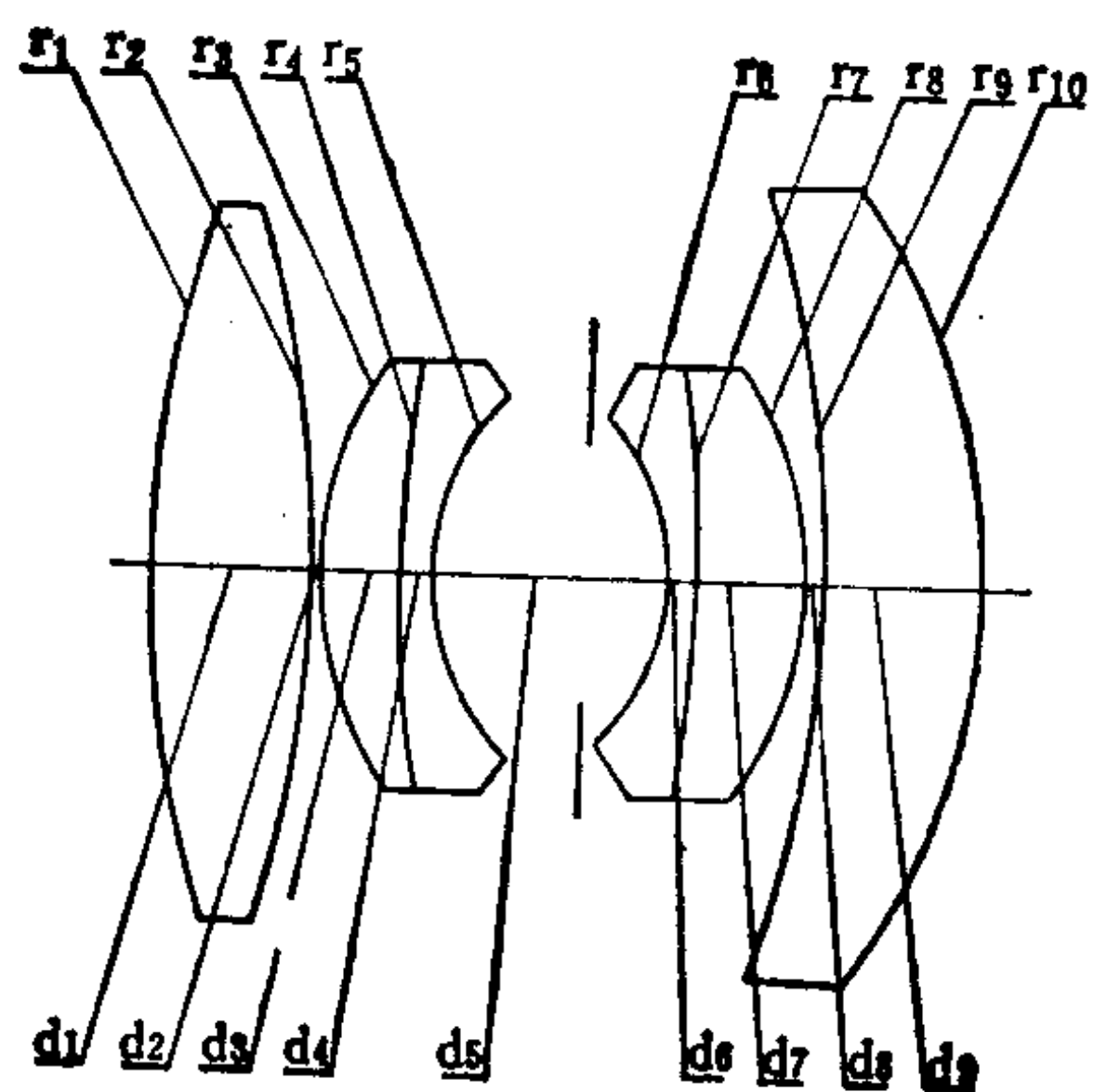
高 倍 率 投 影 物 镜

E.F.L=10

B.F.L=3.76

FNo.=2

F.A.=±14.7°**

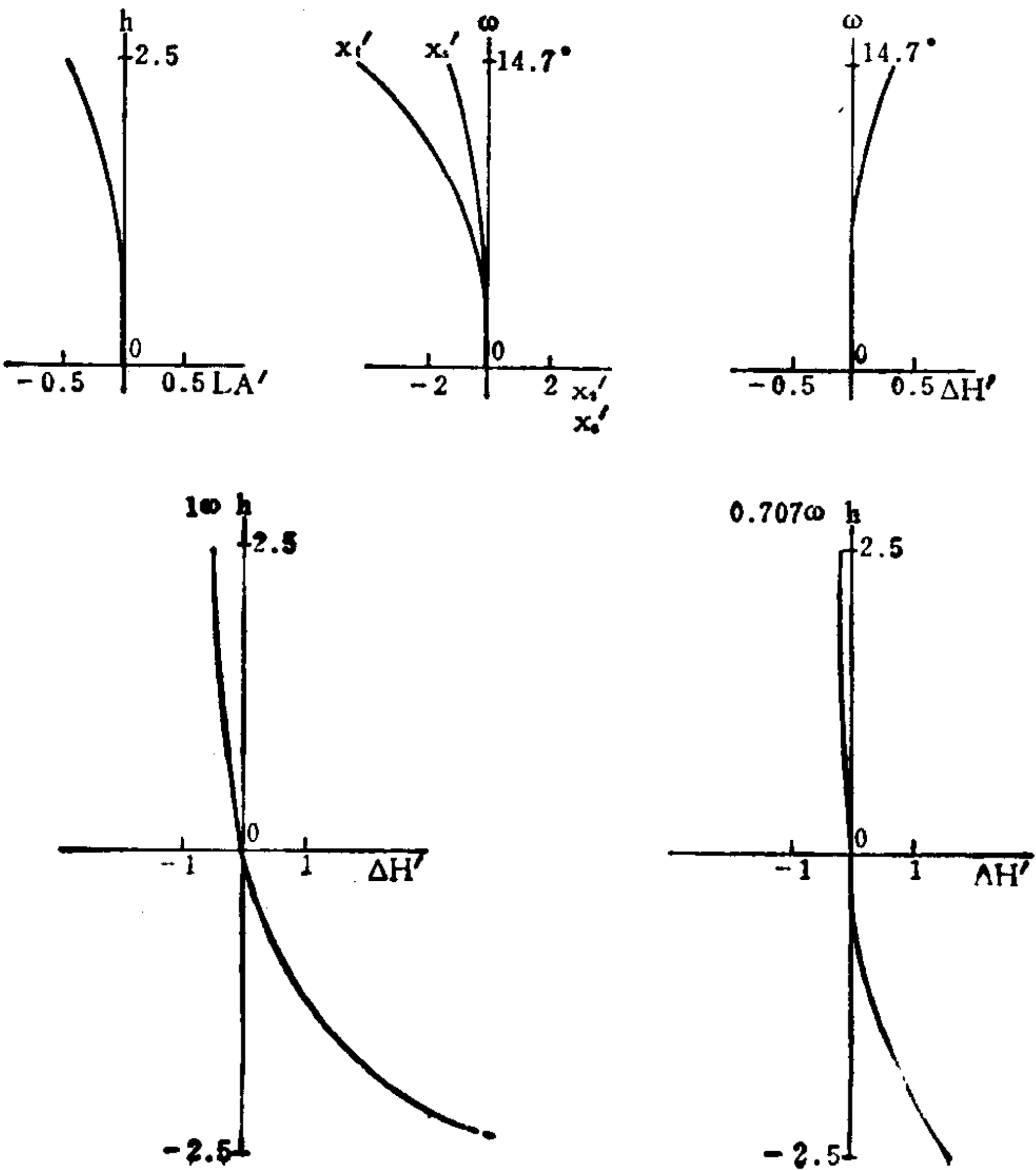


序号	r	d	n	v	序号	r	d	n	v
1	14.18	1.92	1.787	50.2	6	-2.70	0.40	1.762	26.6
2	-13.51	0.07			7	-14.02	1.29	1.804	46.7
3	4.34	0.95	1.658	57.3	8	-3.93	0.03		
4	17.07	0.39	1.593	35.3	9	-18.43	1.94	1.804	46.7
5	3.11	2.70*			10	-7.27			

2.70* = 1.35 + 1.35

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.0472	0.0761	-0.1184	-0.0093	0.1357	2.6	13.8%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.437	0.361	-4.422	-1.313	-3.109	2.5650	0.8134
70	-0.199	0.093	-1.625	-0.532	-1.093	0.7974	0.3041

注: 以上象差值是按 $l = -\infty$ 计算的。



编号: 07-04-076

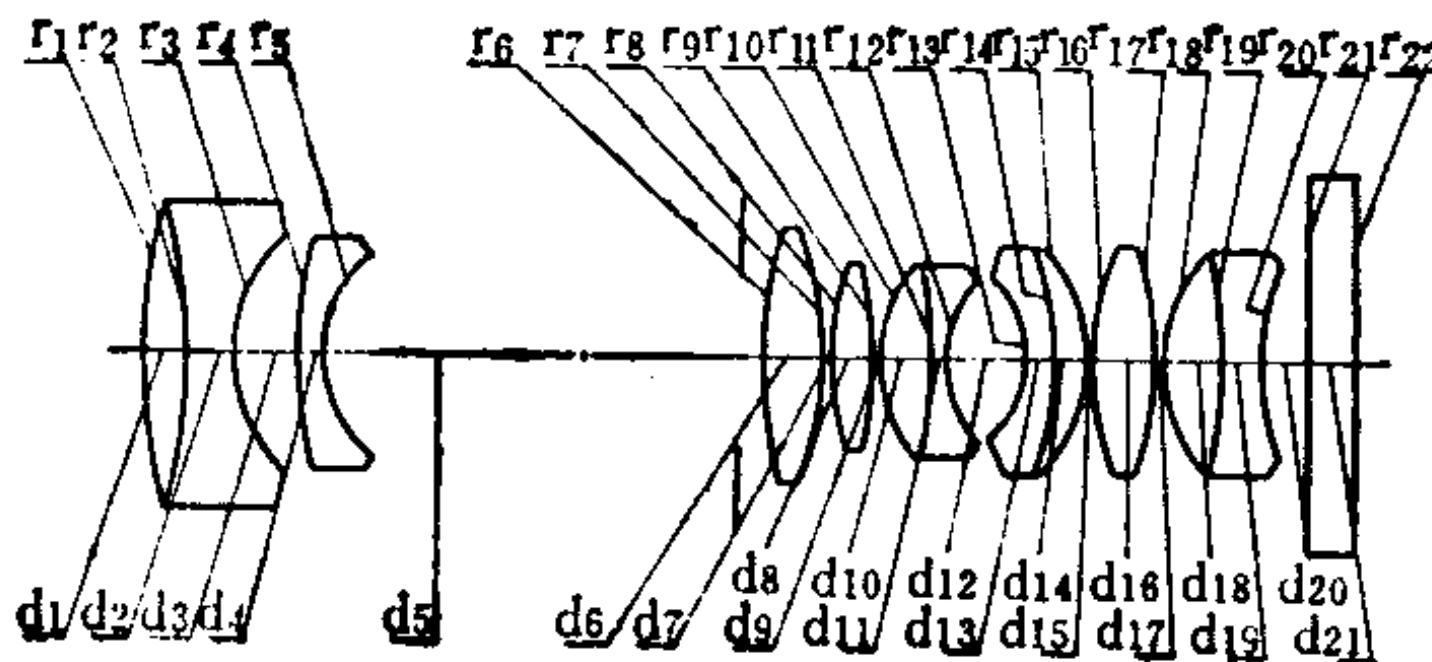
超高倍率投影物镜

E.F.L=1

B.F.L=0

FNo. = 3.5**

F.A. = $\pm 17.2'$ **

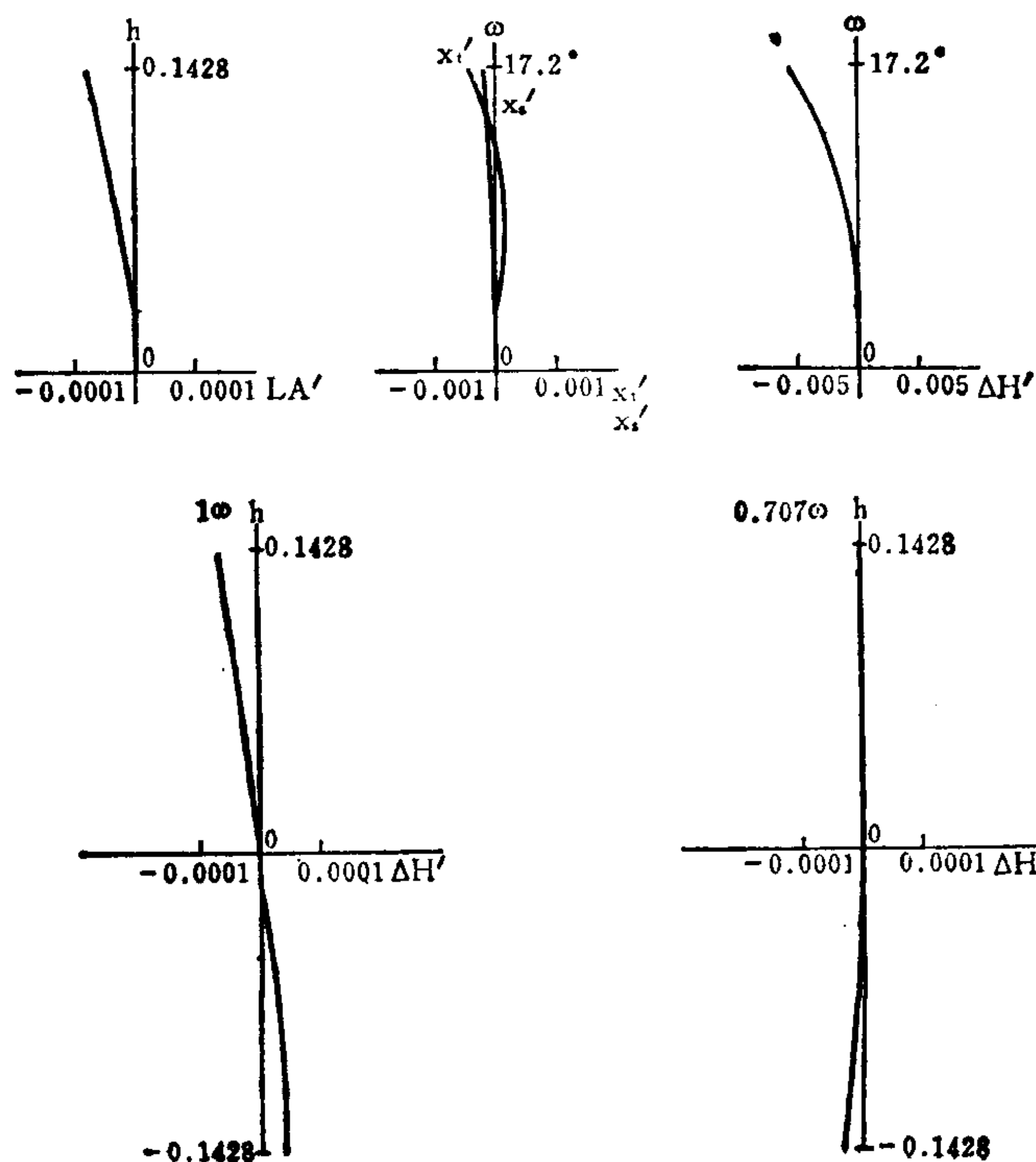


序号	r	d	n	v	序号	r	d	n	v
1	11.18077	0.44663	1.80523	25.43	12	1.71570	0.96731		
2	-12.48247	0.74052	1.43387	95.15	13	-1.80295	0.37026	1.73539	40.92
3	2.45901	0.84698			14	-5.90960	0.48134	1.60710	59.00
4	31.70140	0.33786	1.51148	51.00	15	-2.40601	0.04397		
5	1.88371	6.44488*			16	4.68590	0.80995	1.60710	59.00
6	11.40778	0.73127	1.51724	52.41	17	-4.90551	0.01388		
7	-5.02030	0.02083			18	2.19357	0.76829	1.60710	59.00
8	3.50199	0.54382	1.43387	95.15	19	-13.30191	0.69887	1.61683	36.50
9	-15.86829	0.02083			20	3.79565	0.53720		
10	2.04269	0.65027	1.43387	95.15	21	∞	0.73474	1.51633	63.98
11	-22.63946	0.21984	1.74947	35.24	22	∞			

$$6.44488^* = 6.31760 + 0.12728$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.0000046	-0.0000018	0.0000191	-0.0000254	-0.0017143	0.3	-1.8%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.000075	-0.00563	-0.00052	-0.00020	-0.00032	-0.000010	-0.000007
70	-0.000047	-0.00211	0.00011	-0.00009	0.00020	-0.000011	-0.000007

注: 1. 以上象差值是按 $l = -\infty$ 计算的。
2. 其NA = 0.38, 投影倍率M = 200 $\times$ 。



编号: 07-04-077

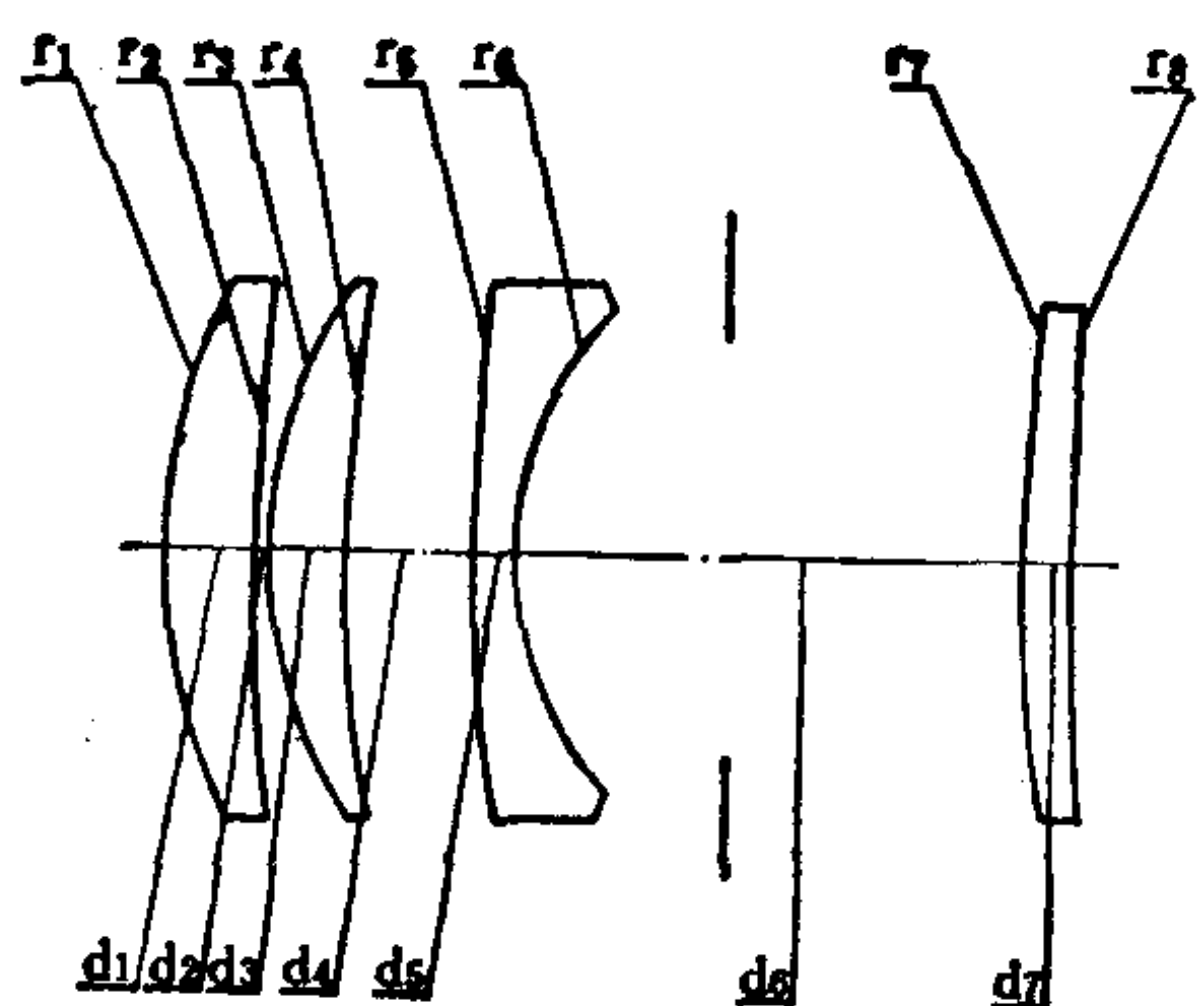
远 摄 物 镜

E.F.L=100

B.F.L=44.69

FNo.=3.5

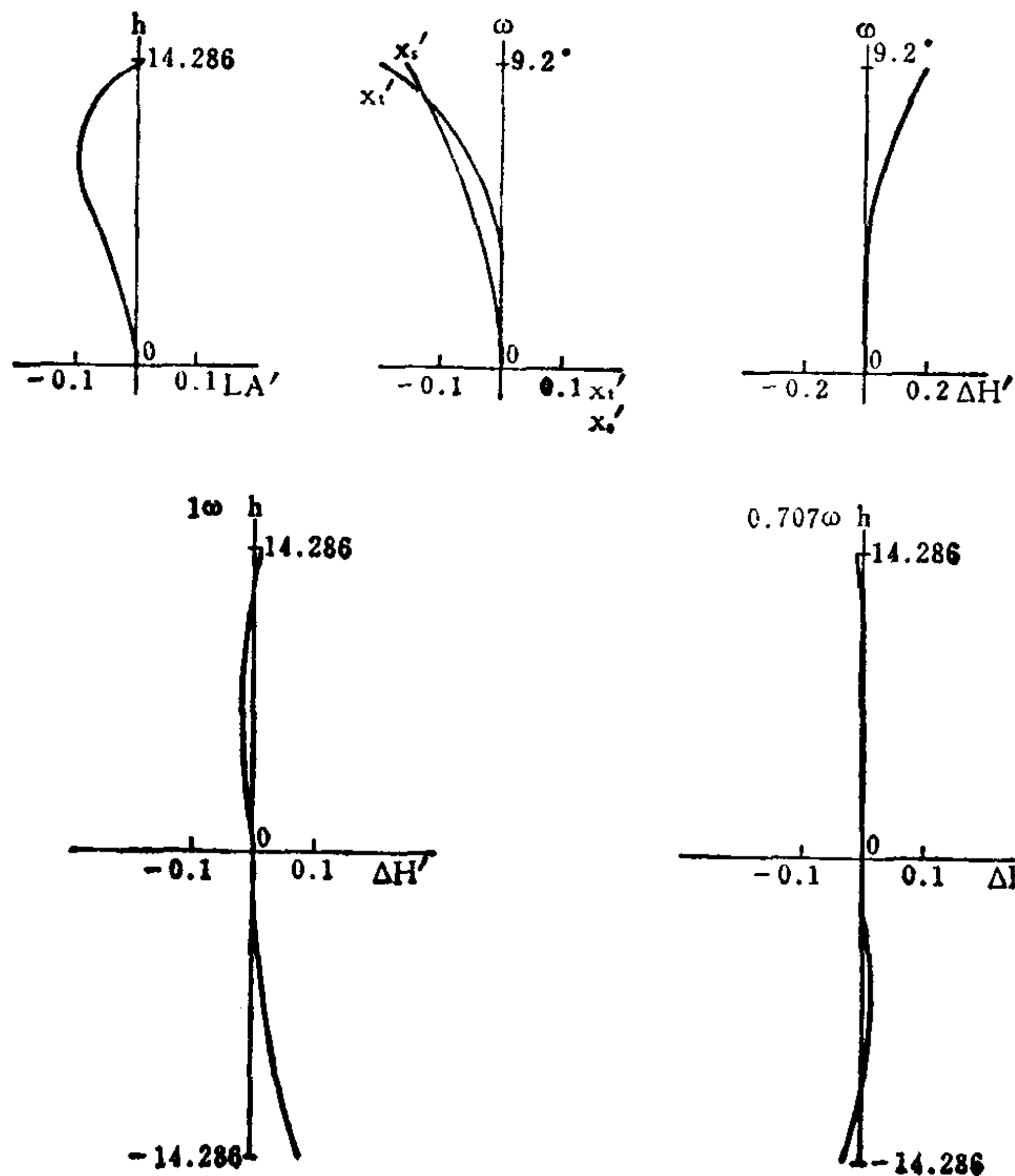
F.A.=±9.2°



序号	r	d	n	v	序号	r	d	n	v
1	33.748	4.44	1.62041	60.3	5	277.147	1.94	1.71736	29.5
2	313.490	0.34			6	18.445	25.85*		
3	25.344	4.13	1.48749	70.1	7	85.929	2.55	1.78472	25.7
4	66.415	6.88			8	1192.200			

25.85* = 12.00 + 13.85

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.01503	0.00159	0.00286	-0.00899	0.05160	16.2	1.1%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.0173	0.187	-0.212	-0.159	-0.053	0.04346	0.02093
70	-0.0965	0.065	-0.044	-0.076	0.032	-0.02452	-0.00168



编号: 07-04-078

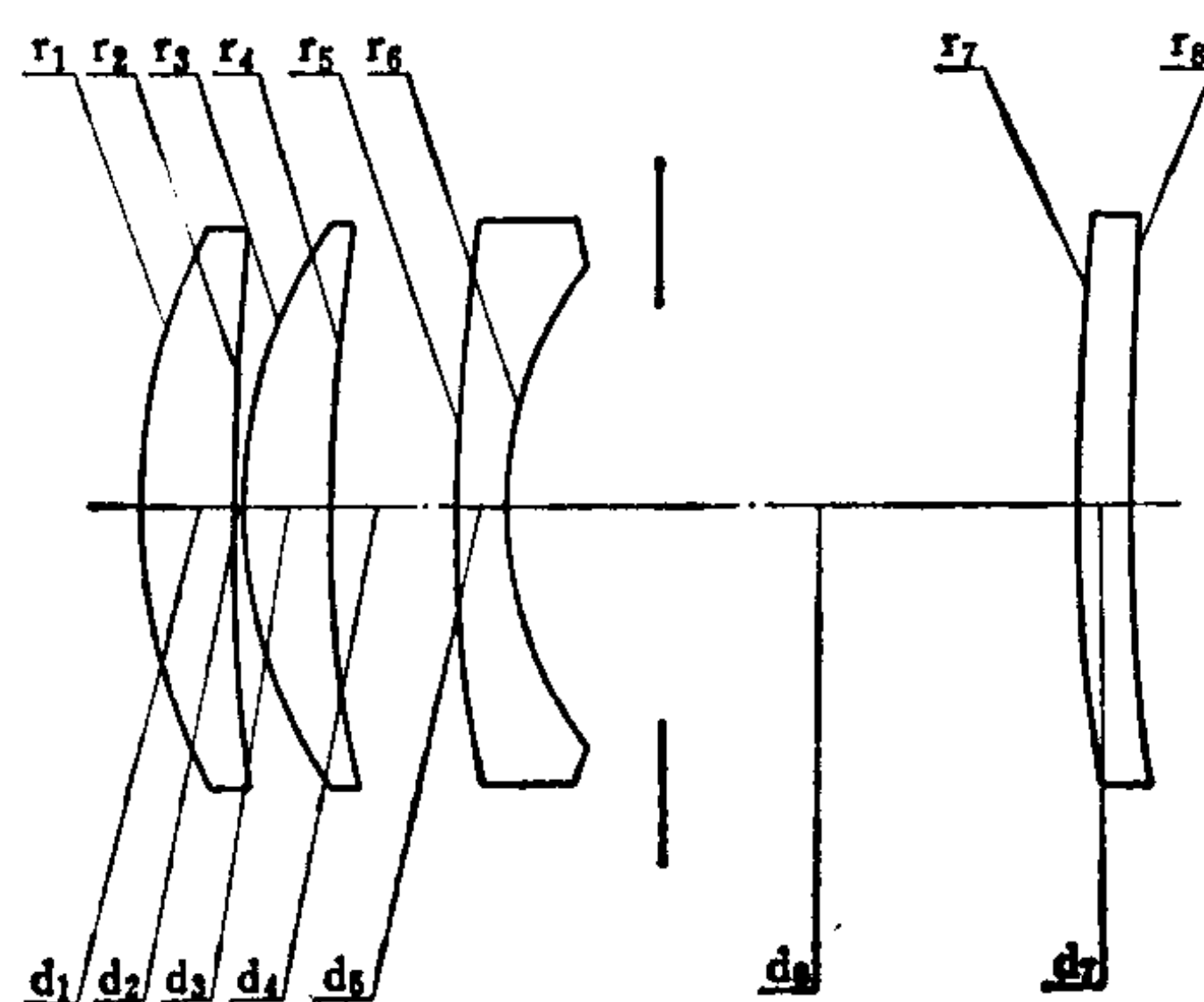
远 摄 物 镜

E.F.L=100

B.F.L=41.78

FNo.=3.5

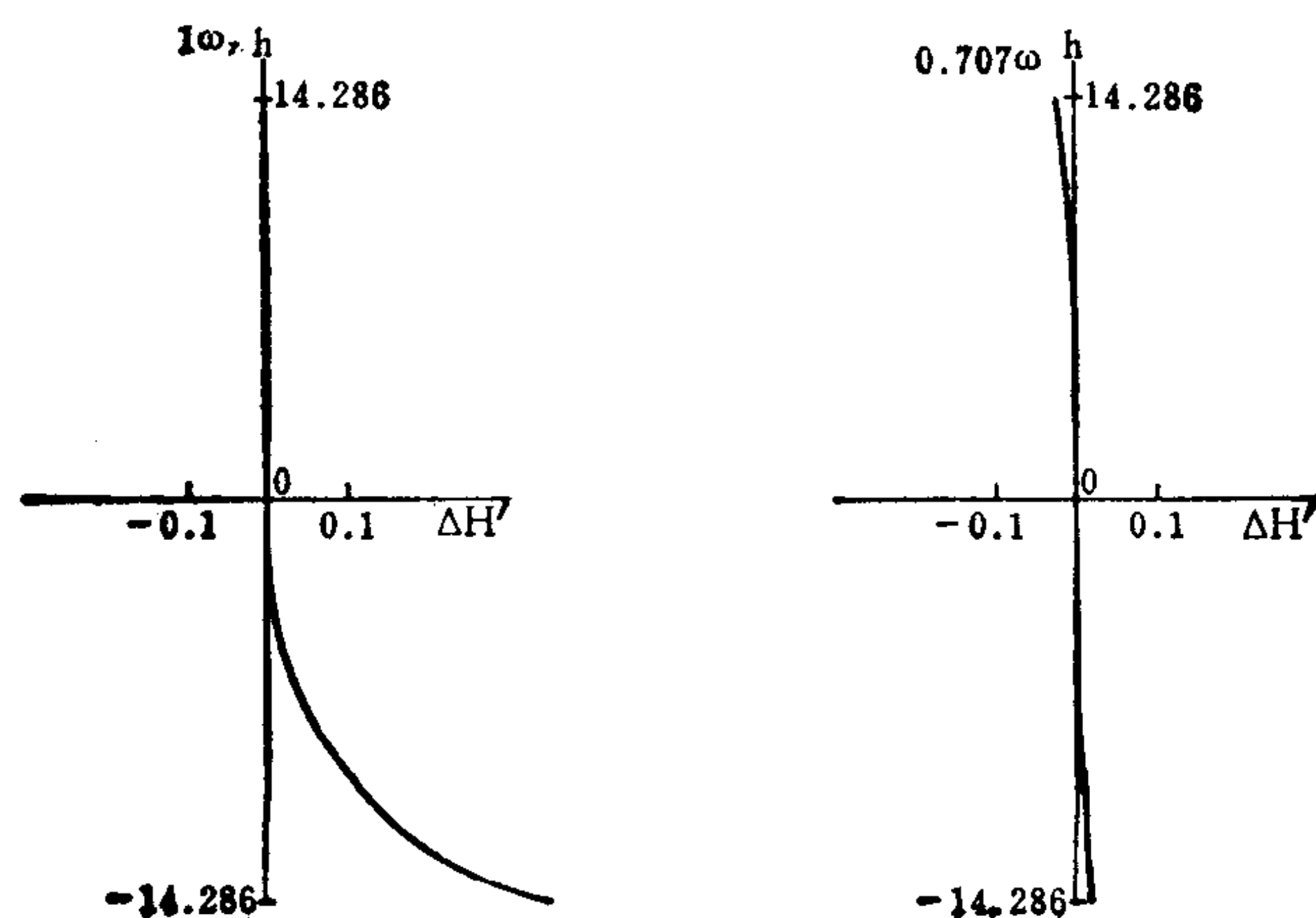
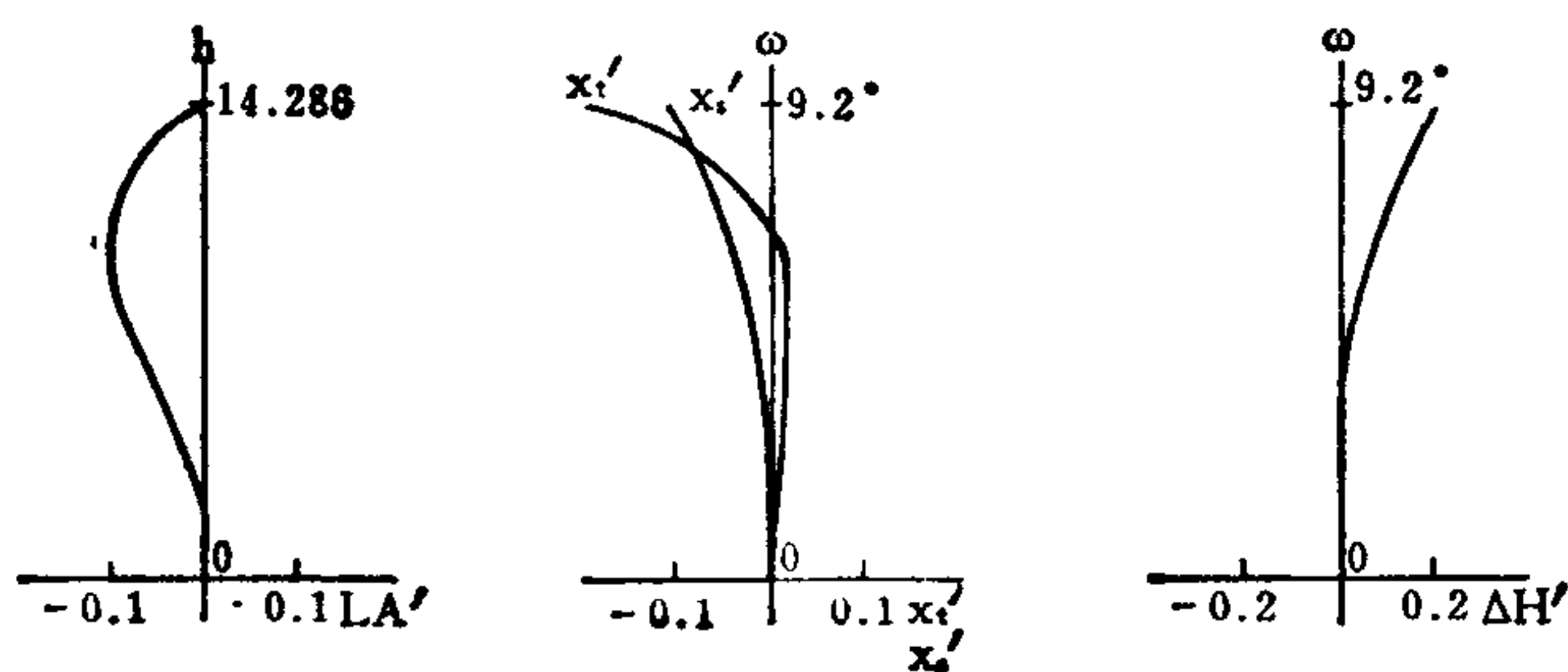
F.A.=±9.2°



序号	r	d	n	v	序号	r	d	n	v
1	32.859	4.430	1.61800	63.4	5	289.480	2.230	1.74000	31.7
2	419.590	0.270			6	18.016	27.594*		
3	24.497	4.120	1.48749	70.2	7	84.561	3.000	1.78472	25.7
4	64.054	6.470			8	829.710			

27.594* = 12.000 + 15.594

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.01586	-0.00047	0.00501	-0.00787	0.05298	16.2	1.2%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.0055	0.197	-0.205	-0.111	-0.094	0.17134	0.05108
70	-0.1030	0.068	0.009	-0.043	0.052	0.00259	0.00139



编号: 07-04-079

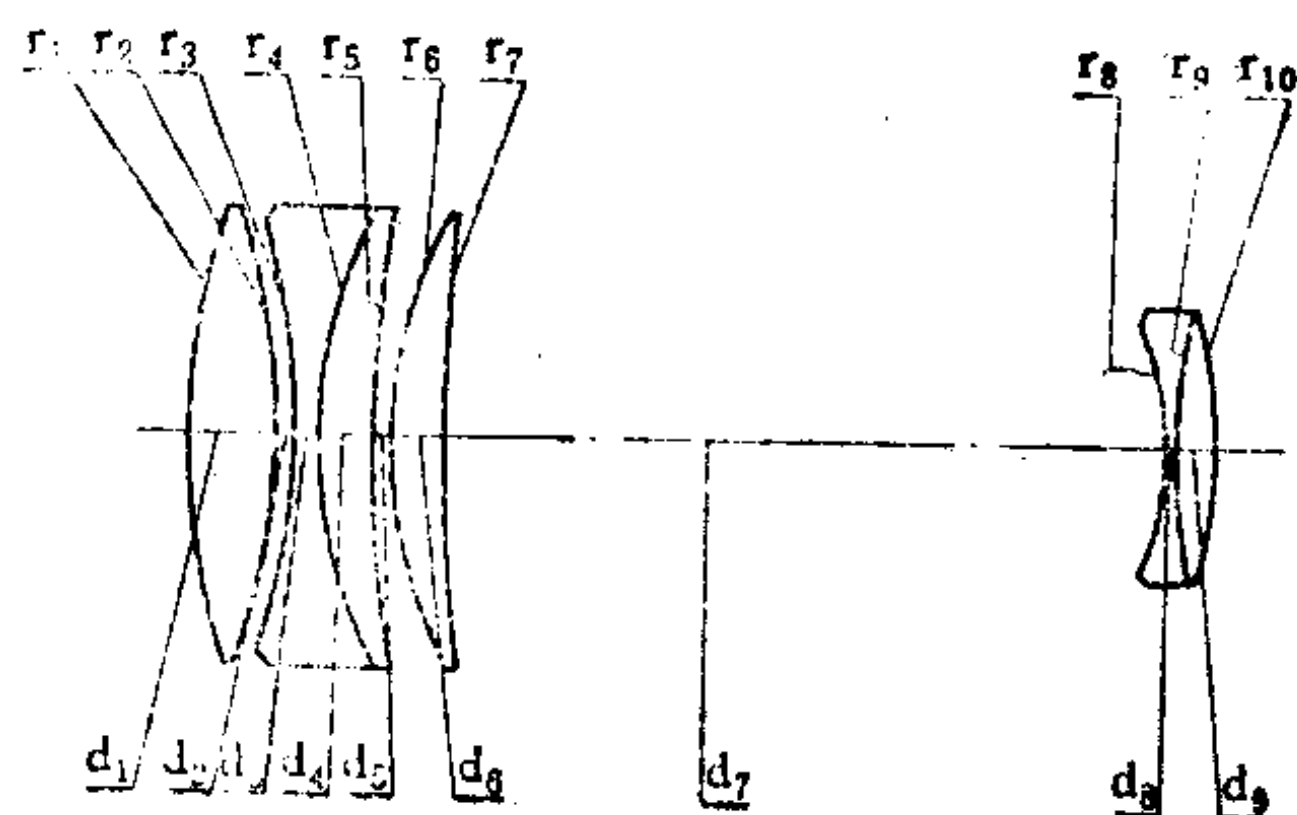
消色差物镜

E.F.L=300

B.F.L=77.18

FNo.=4.5

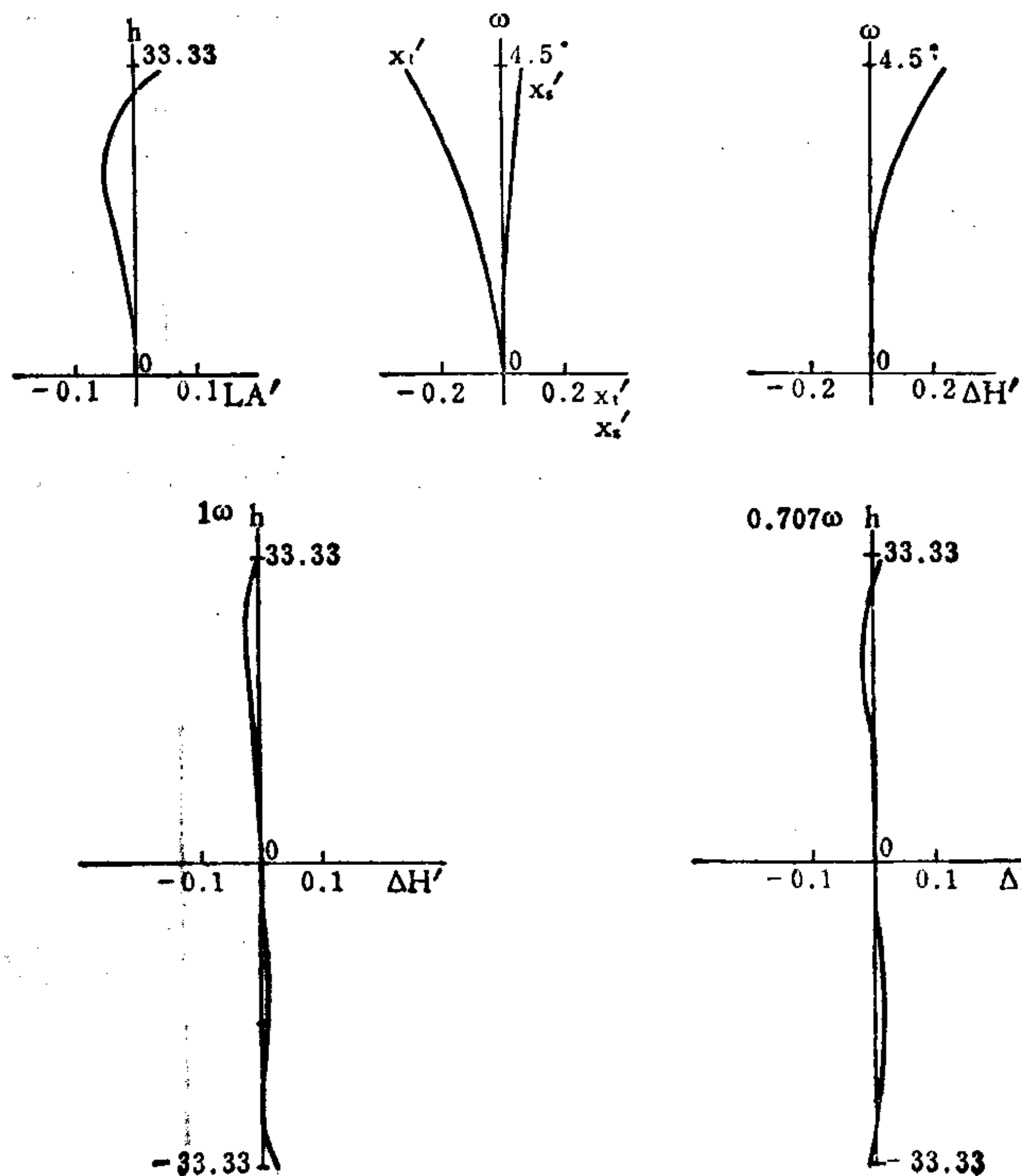
F.A.=±4.5°



序号	r	d	n_d	v_d	序号	r	d	n_d	v_d
1	133.00	12.0	1.50032	81.9	6	82.75	7.7	1.50032	81.9
2	-140.00	4.0			7	322.40	115.0*		
3	-128.00	3.0	1.61266	44.3	8	-42.56	1.0	1.62041	60.3
4	70.00	9.0	1.63930	45.0	9	220.00	3.5	1.62004	36.3
5	316.30	1.0			10	-91.10			

115.0* = 57.5 + 57.5

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00594	0.00039	-0.00513	0.00661	0.05260	23.6	1%
h 或 ω %	LA'	$\Delta H'$	x'_1	x'_2	$x'_1 - x'_2$	K'_{T1}	$K'_{T0.7}$
100	0.0425	0.241	-0.314	0.062	-0.376	0.00988	-0.00909
70	-0.0424	0.084	-0.166	0.030	-0.196	-0.00538	-0.00508



编号: 07-04-080

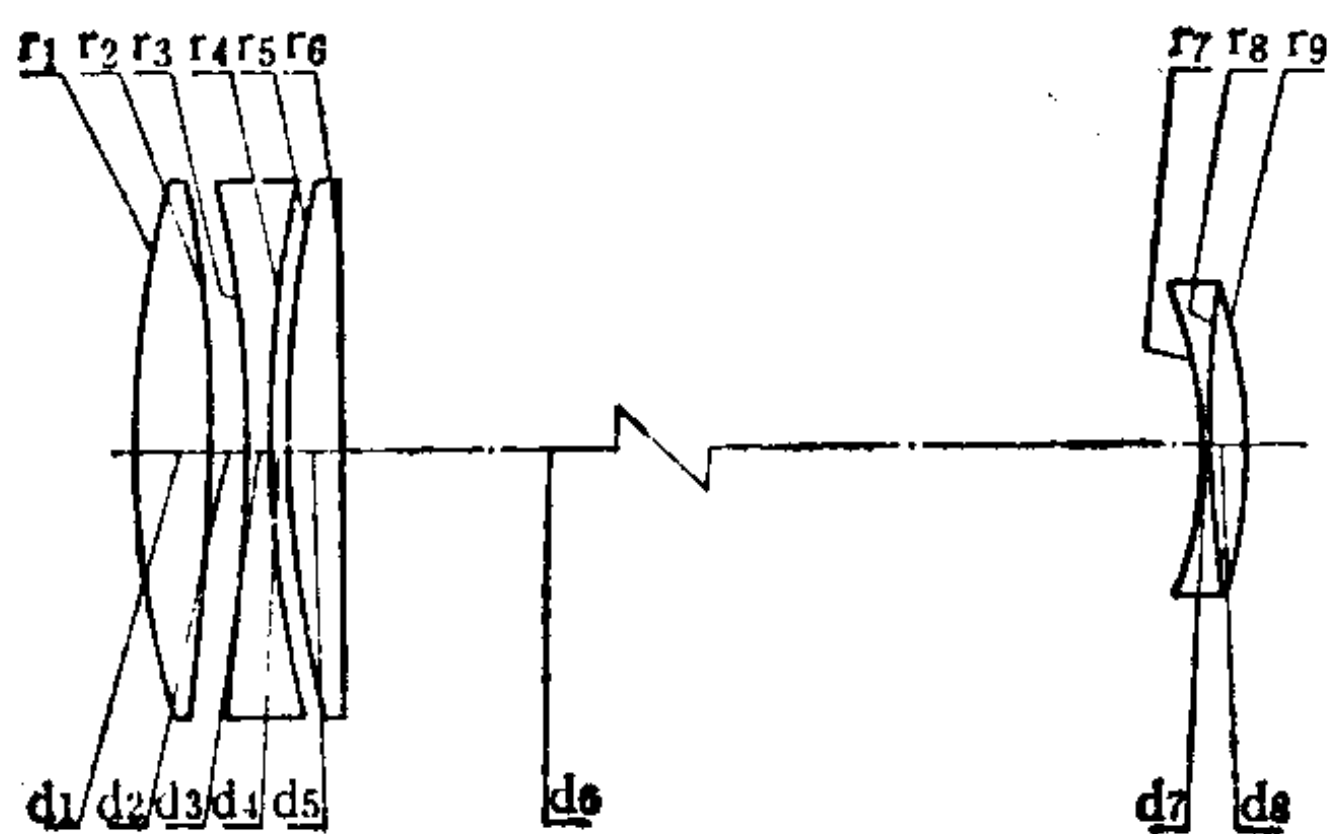
消色差物镜

E.F.L=600

B.F.L=248.12

FNo.=5.6

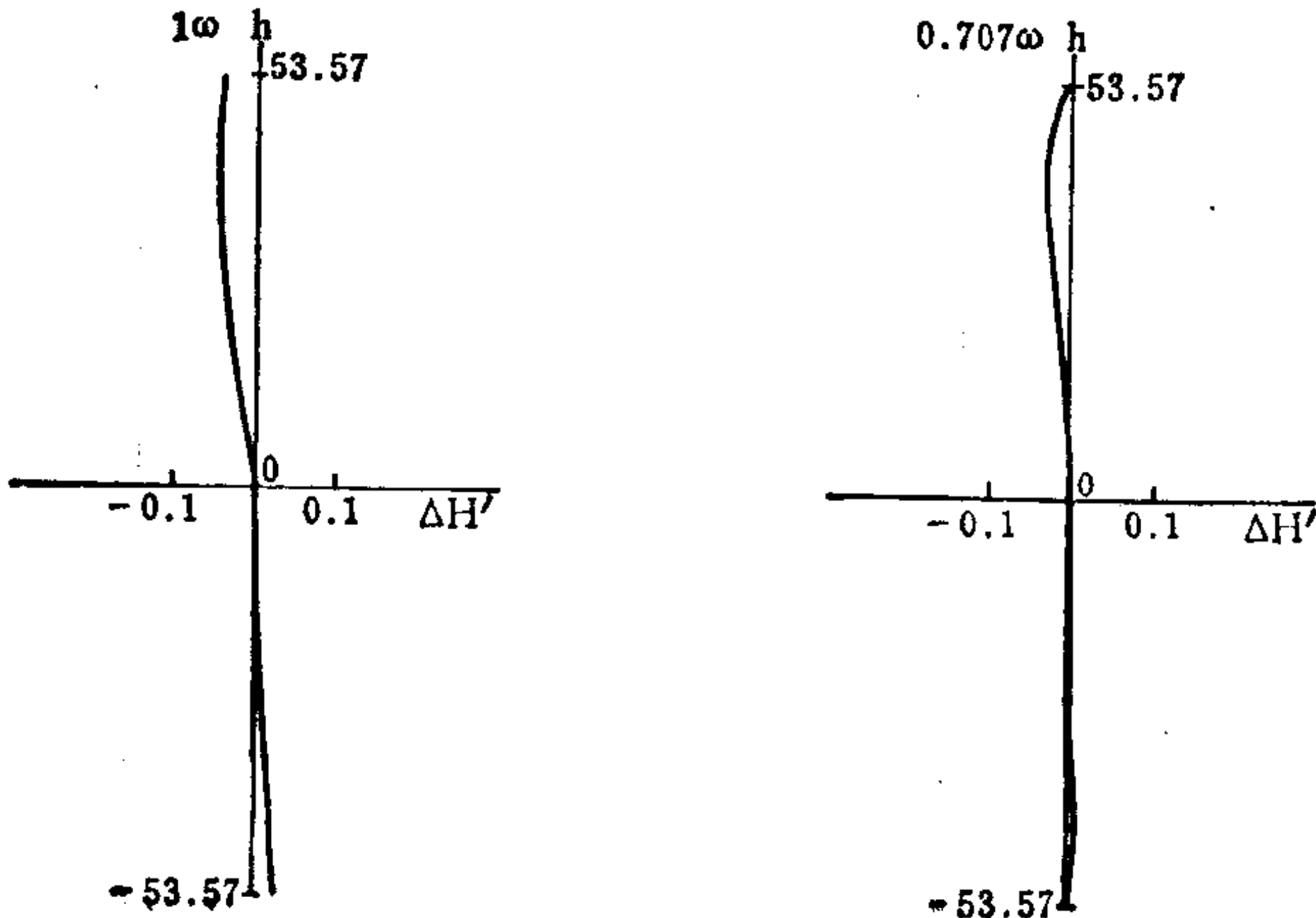
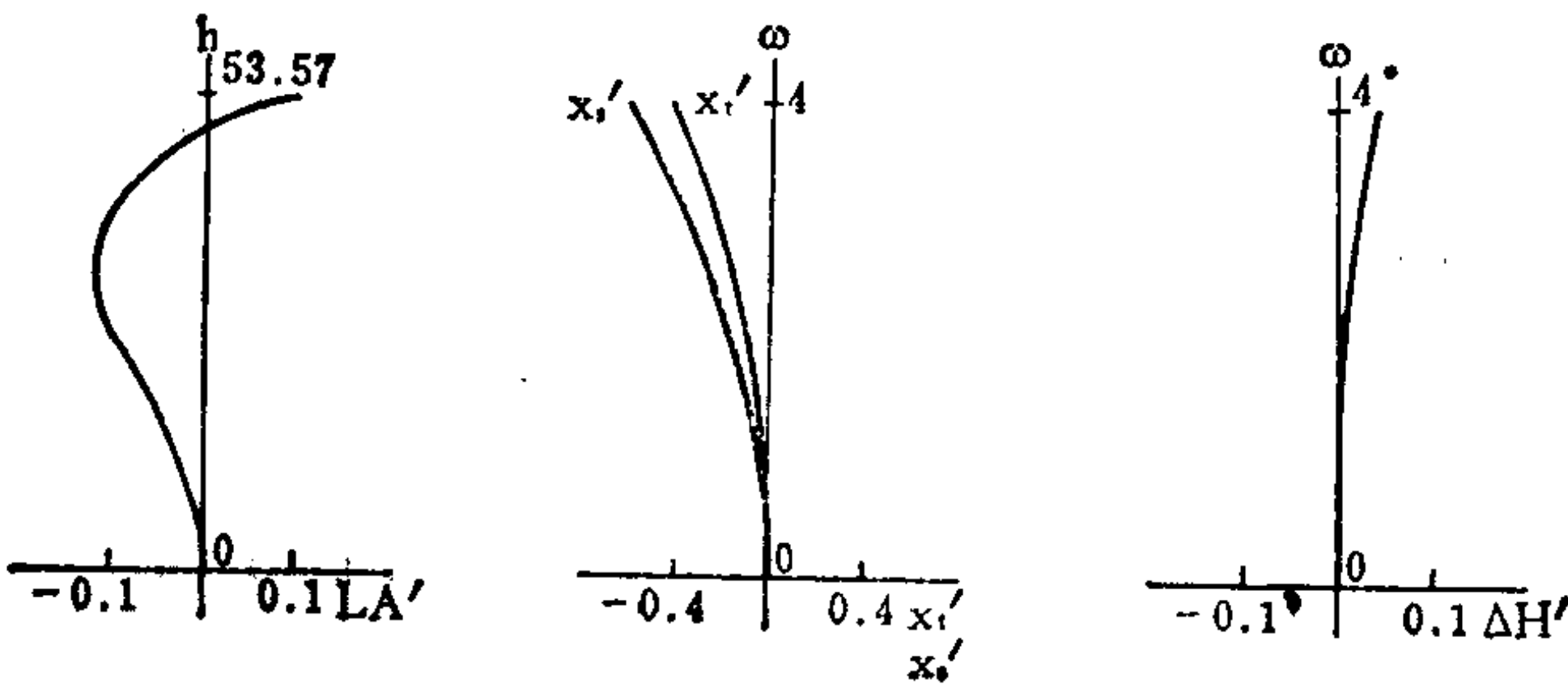
F.A.=±4°



序号	r	d	nd	vd	序号	r	d	nd	vd
1	206.0	15.0	1.50032	81.9	6	∞	254.0*		
2	-312.1	6.0			7	-93.0	1.5	1.52682	51.1
3	-299.0	6.0	1.74400	44.9	8	200.0	6.0	1.62374	47.0
4	334.9	1.5			9	-146.9			
5	213.4	10.0	1.56965	49.5					

254.0* = 127.0 + 127.0

	ΣS ₁	ΣS ₂	ΣS ₃	ΣS ₄	ΣS ₅	HI	QP(1ω)
	-0.00850	-0.00099	0.00159	-0.01099	0.00835	41.9	0.1%
h 或 ω %	LA'	ΔH'	x _t '	x _s '	x _t ' - x _s '	K _{T1} '	K _{T0.7} '
100	0.0935	0.045	-0.437	-0.597	0.160	0.00147	-0.01205
70	-0.1155	0.016	-0.206	-0.297	0.091	0.00130	-0.00614



编号: 07-04-081

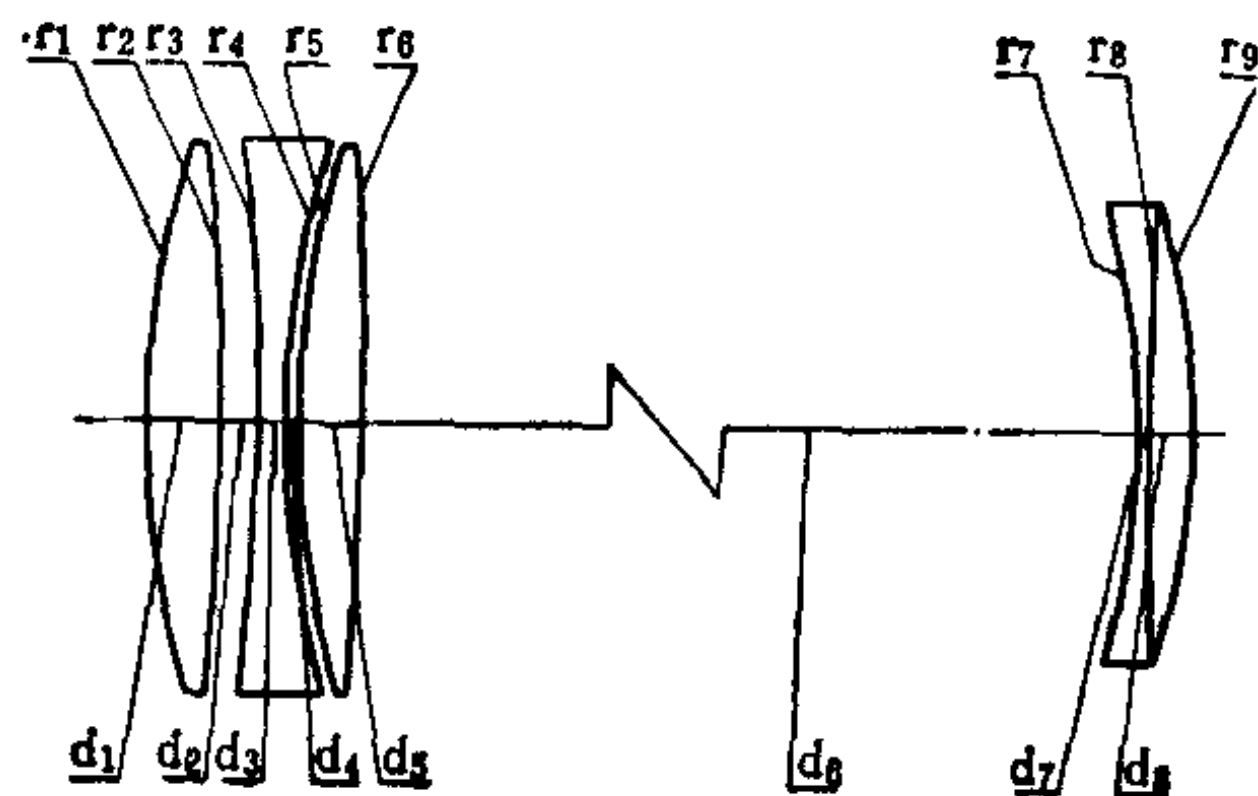
消色差物镜

E.F.L=800

B.F.L=241.08

FNo.=8

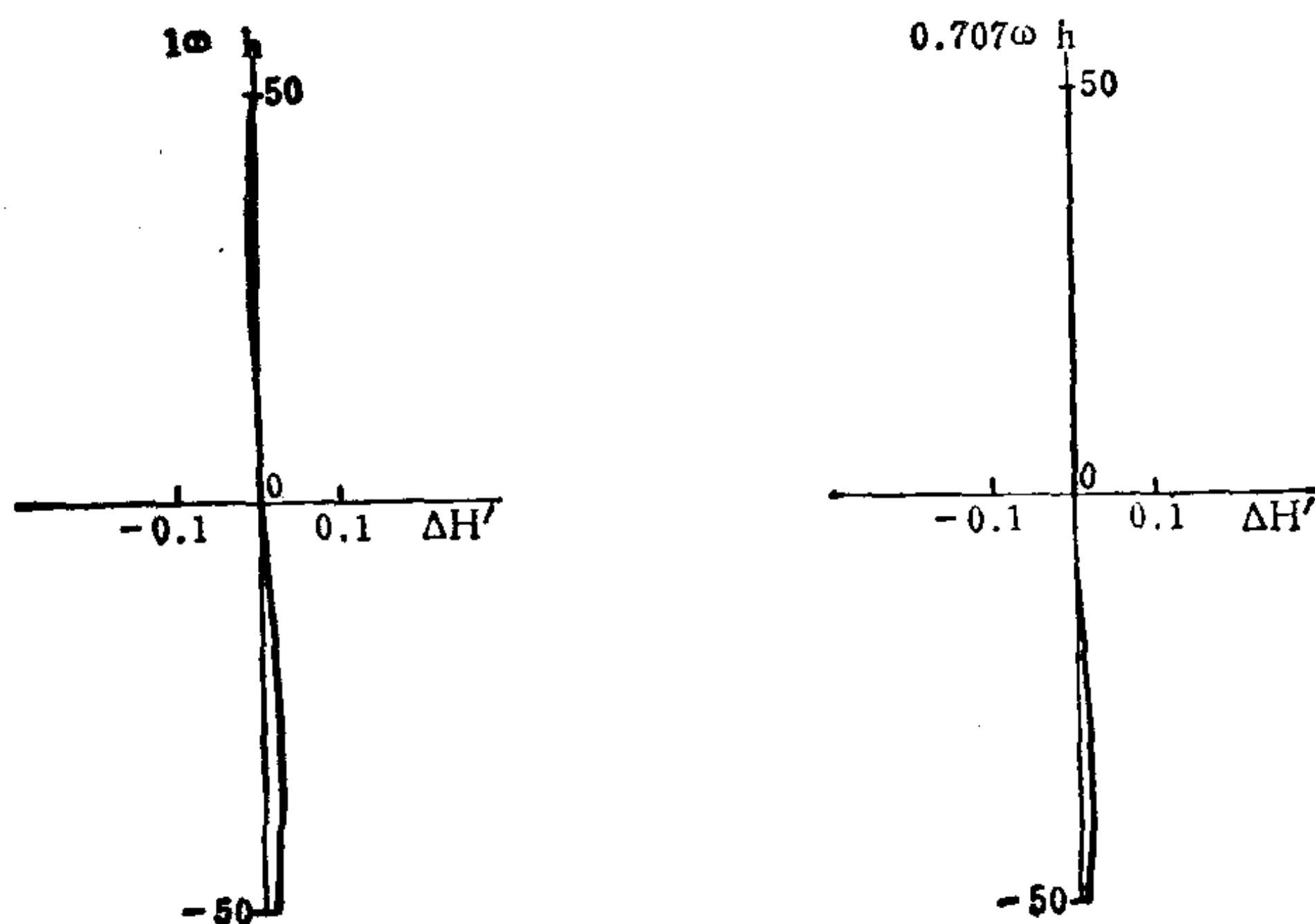
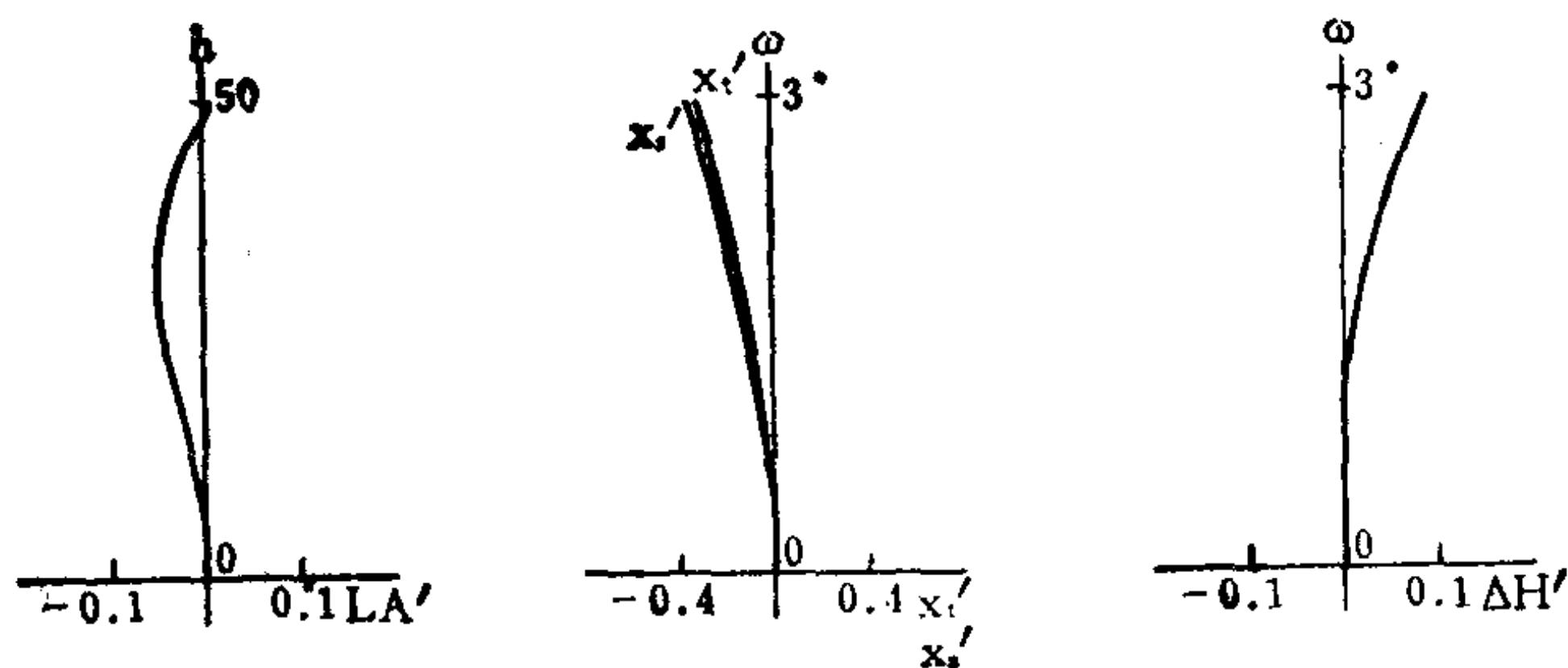
F.A.=±3°



序号	r	d	n _d	v _d	序号	r	d	n _d	v _d
1	305.0	13.0	1.50032	81.9	6	-2056.2	435.0*		
2	-445.2	7.3			7	-150.0	2.0	1.51885	59.0
3	-391.7	7.5	1.61266	44.3	8	∞	5.0	1.62399	47.0
4	310.3	1.5			9	-233.7			
5	290.0	10.0	1.56965	49.5					

$$435.0^* = 22.0 + 413.0$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1ω)
	-0.00177	0.00062	0.00005	-0.00302	0.01158	41.9	0.2%
h 或 ω %	LA'	ΔH'	x _t '	x _s '	x _t ' - x _s '	K _{T1}	K _{T0.7}
100	0.0127	0.093	-0.343	-0.374	0.031	0.00770	0.00721
70	-0.0557	0.033	-0.177	-0.188	0.011	0.00337	0.00407



编号: 07-04-082

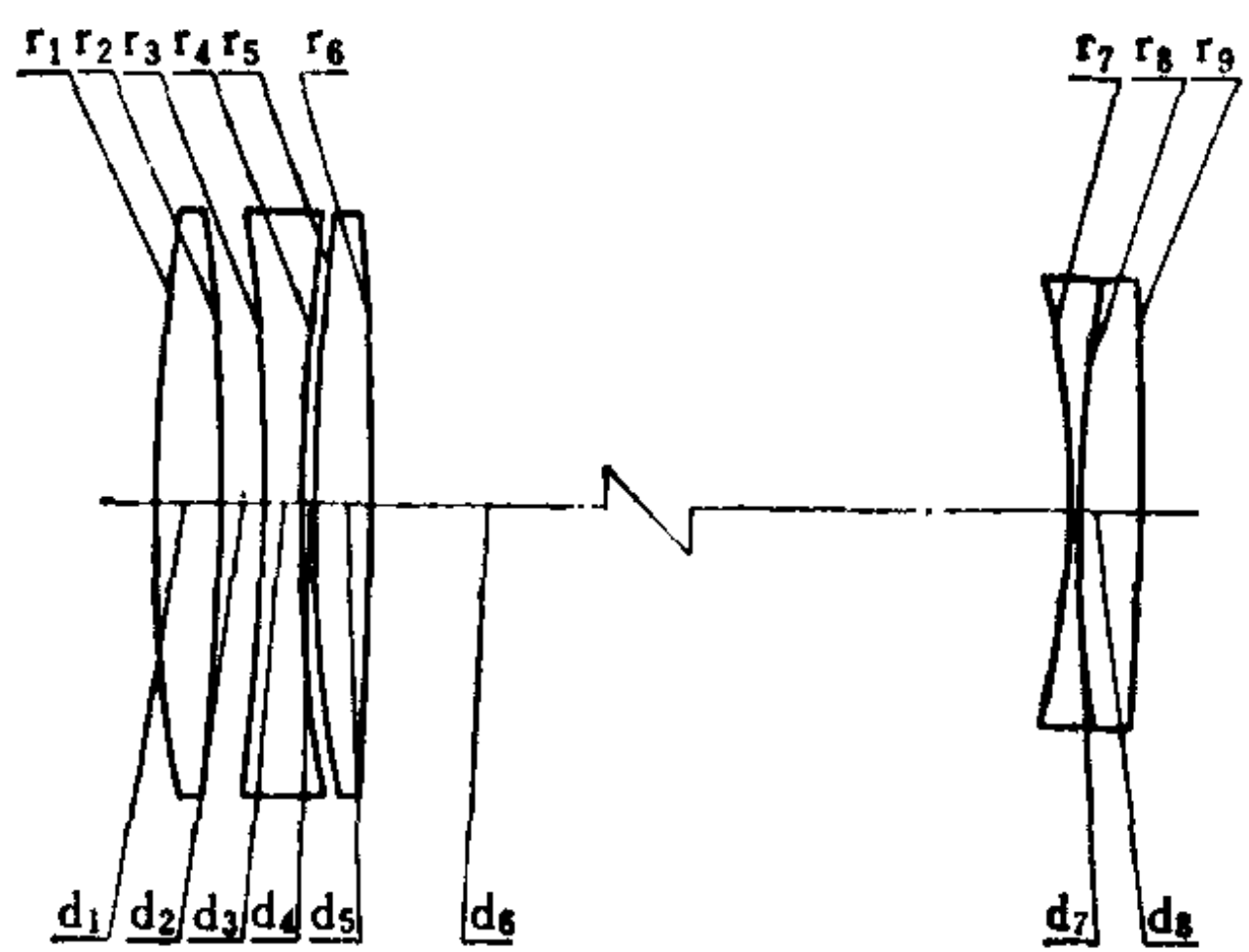
消色差物镜

E.F.L=1200

B.F.L=240.04

FNo.=11

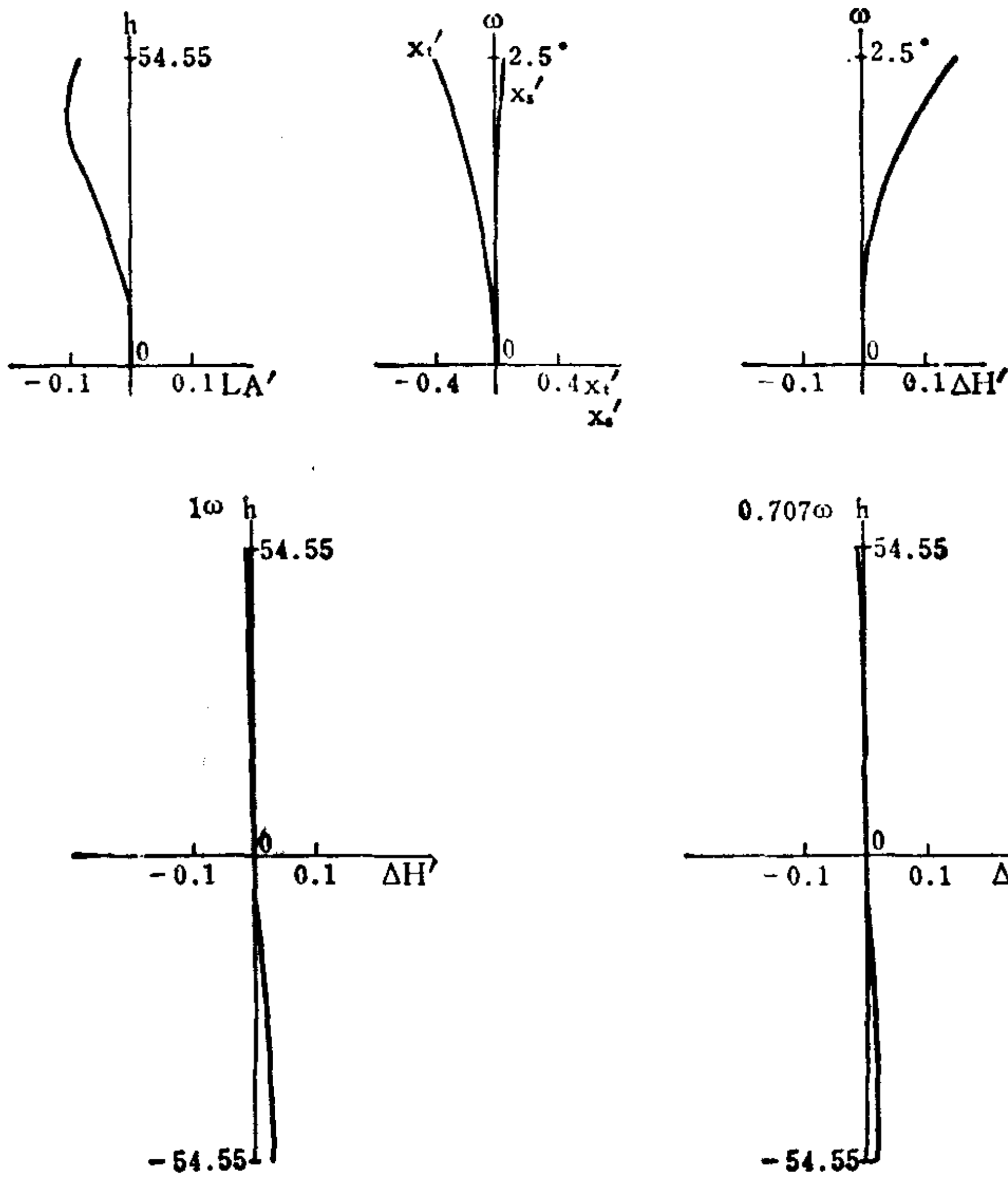
F.A.=±2.5°



序号	r	d	n_d	v_d	序号	r	d	n_d	v_d
1	412.0	13.0	1.50032	81.9	6	-873.9	659.0*		
2	-435.3	8.0			7	-195.0	2.0	1.51632	64.2
3	-403.2	8.0	1.74400	44.9	8	439.2	7.0	1.66854	39.2
4	445.2	2.0			9	-927.5			
5	396.7	10.0	1.62374	47.0					

$659.0^* = 50.0 + 609.0$

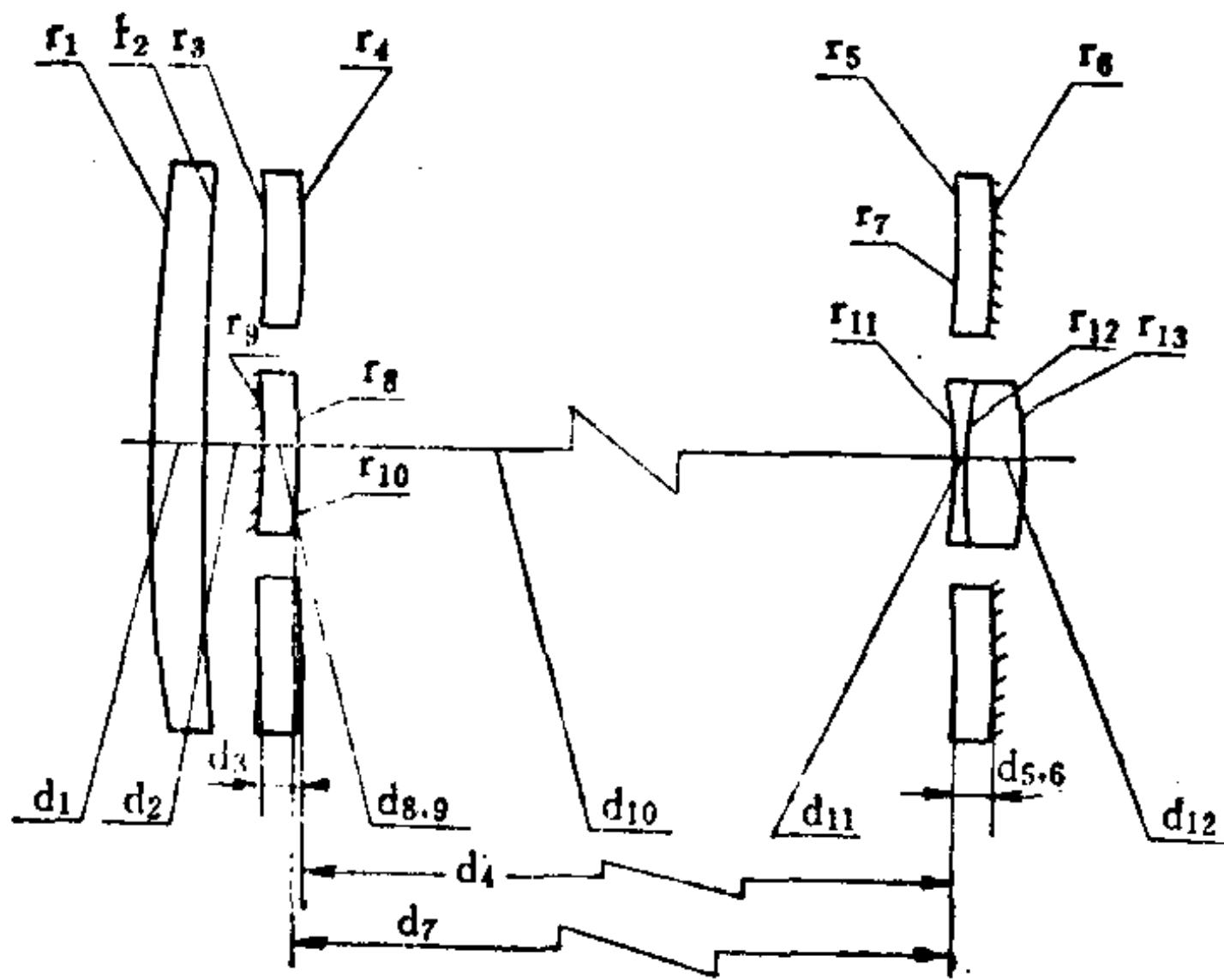
	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00131	0.00073	-0.00103	0.00118	0.01345	52.3	0.28%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.0875	0.148	-0.415	0.061	-0.476	0.00899	0.00929
70	-0.0919	0.052	-0.209	0.035	-0.244	0.00508	0.00592



编号: 07-04-083

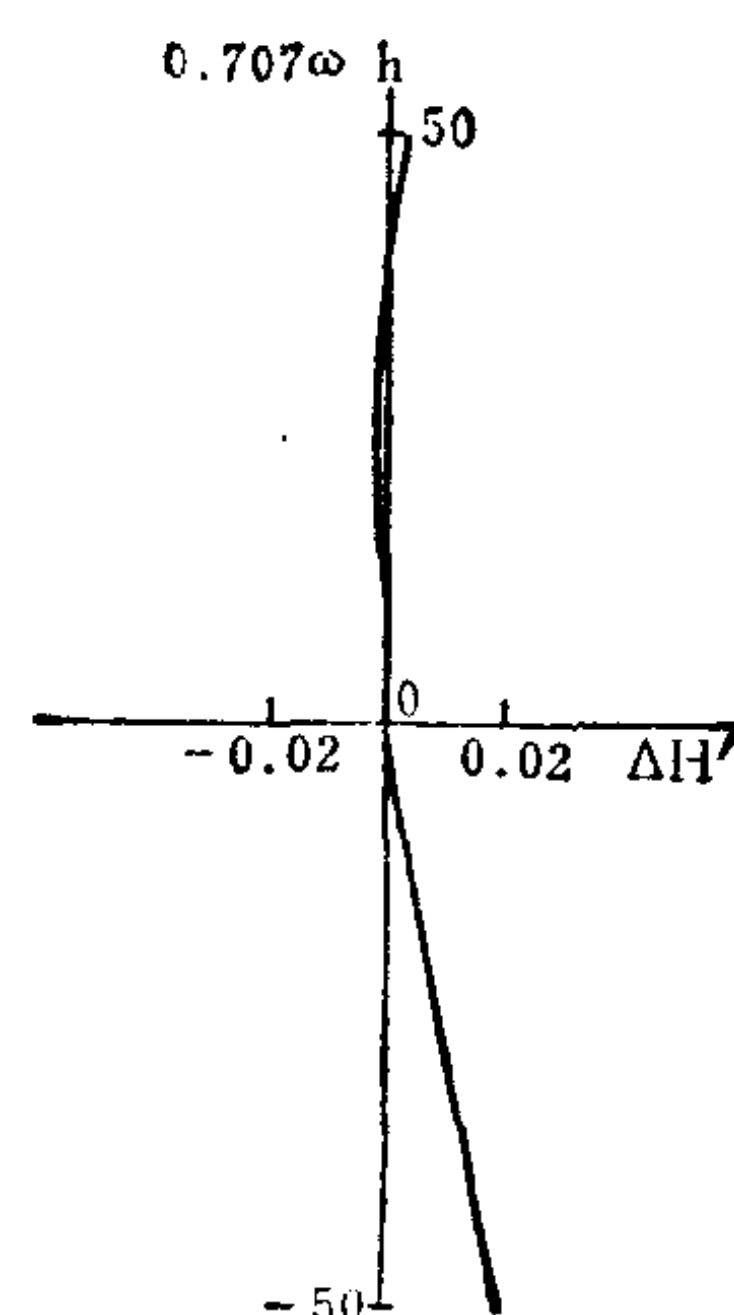
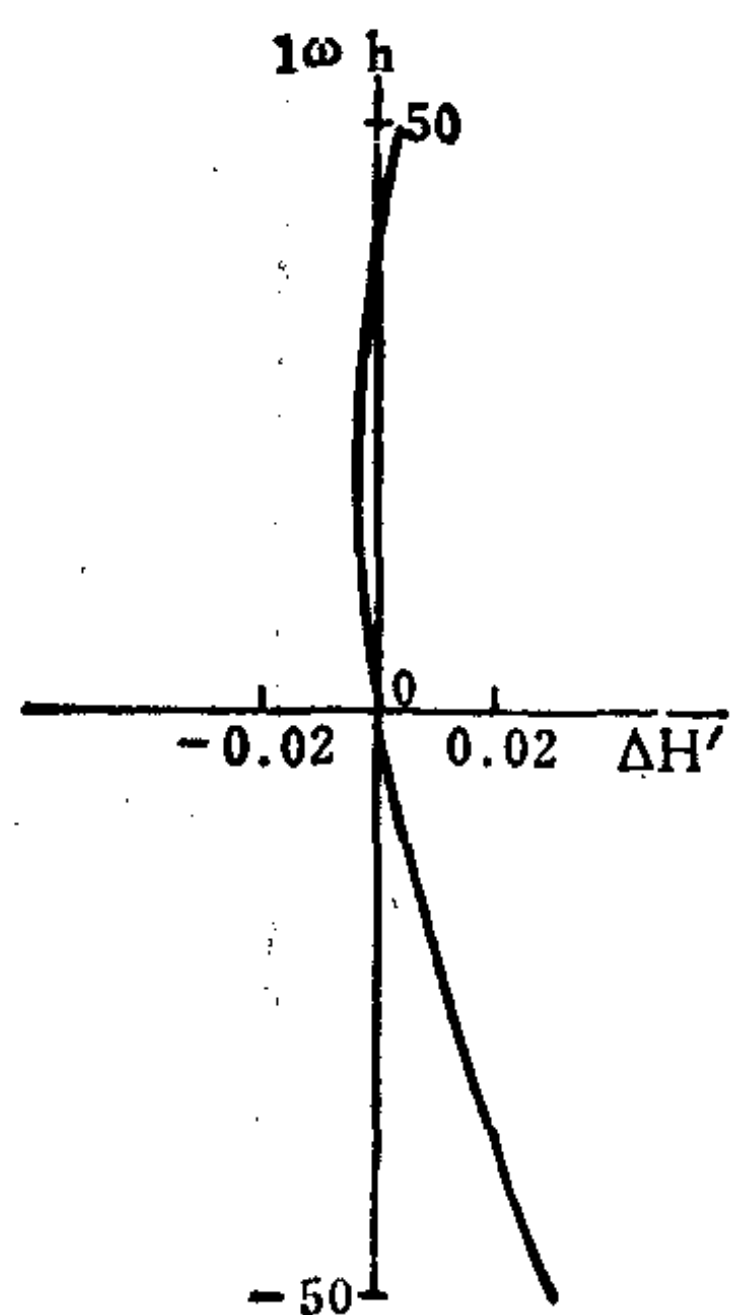
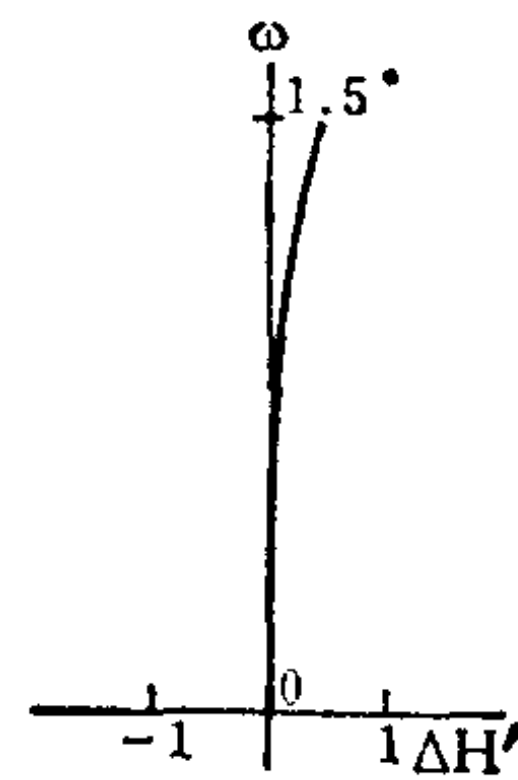
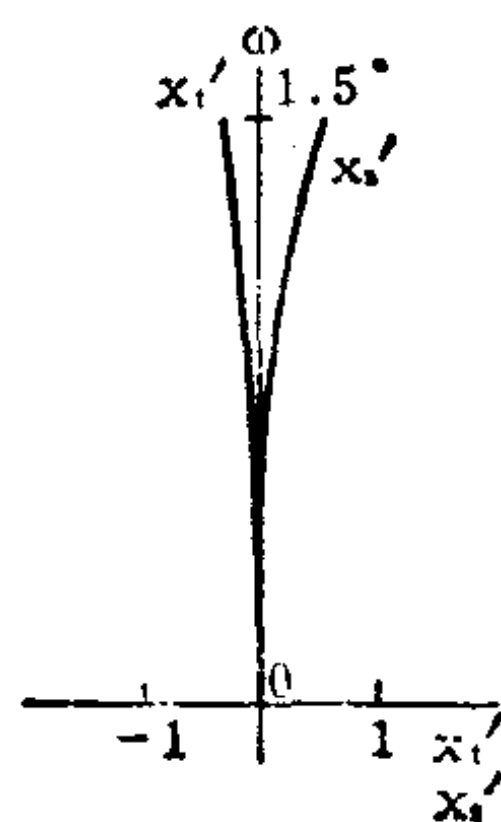
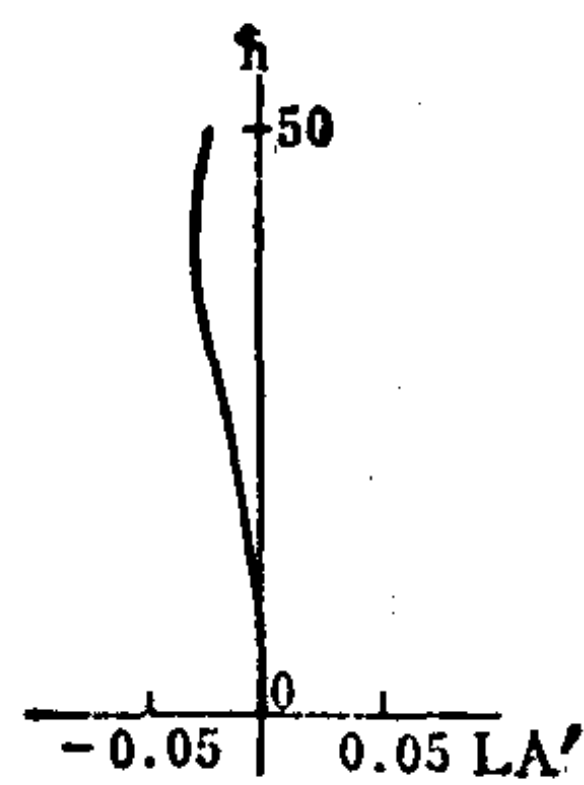
长焦距折反射式物镜

E.F.L=1003.3 B.F.L=51.3 FNo.=10 F.A.= $\pm 1.5^\circ$ ** $L'_{p1}=0$



序号	r	d	n	v	序号	r	d	n	v
1	440.0	7	1.50977	62.1	8	-1200.0	-3	-1.64000	60.2
2	1691.6	6	1.00000		9	-450.0	3	1.64000	60.2
3	-533.0	5	1.62606	39.1	10	-1200.0	180	1.00000	
4	-882.2	180	1.00000		11	-100.0	2	1.77252	49.6
5	-700.0	5	1.51823	59.0	12	55.0	7	1.67270	32.2
6	-661.4	-5	-1.51823	59.0	13	-224.0			
7	-700.0	-182	-1.00000						

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.00039	0.00054	-0.00205	0.00428	0.03486	26.3	1.4%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.0211	0.383	-0.276	0.470	-0.746	0.01772	0.00929
70	-0.0255	0.129	-0.168	0.229	-0.397	0.01134	0.00597



编号: 07-04-084

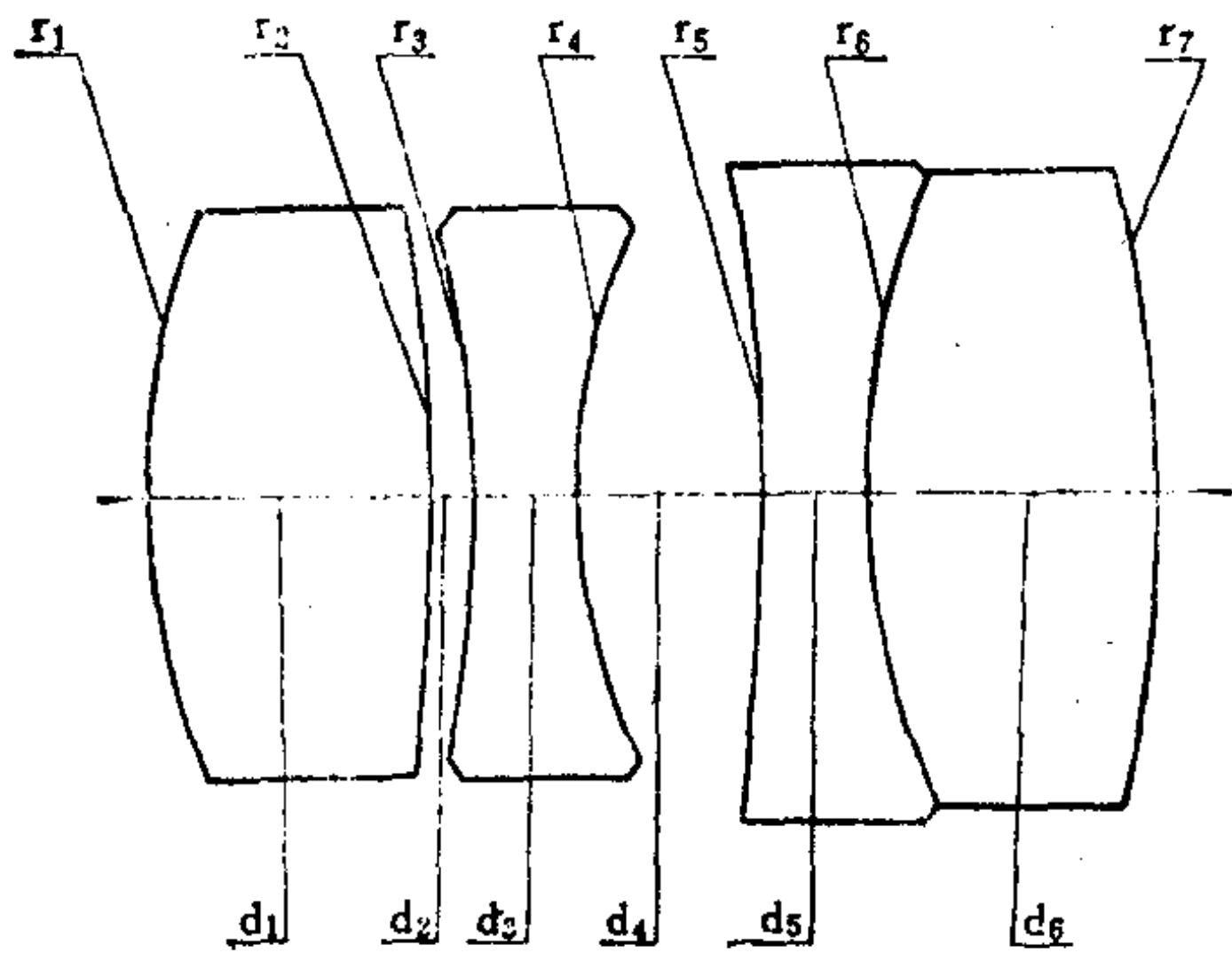
摄影机用摄影镜头

E.F.L=1

B.F.L=0.804

FNo.=3.5

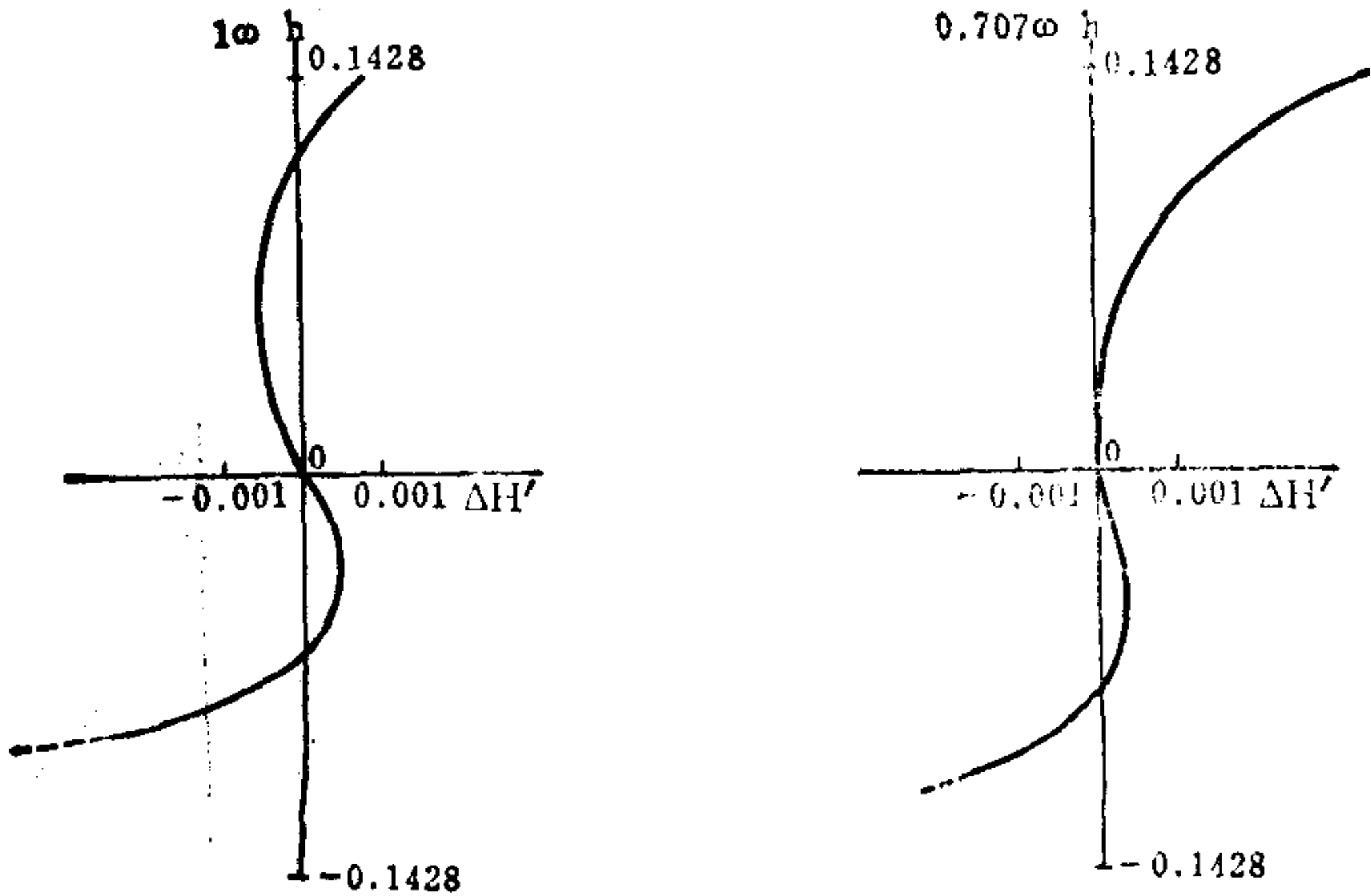
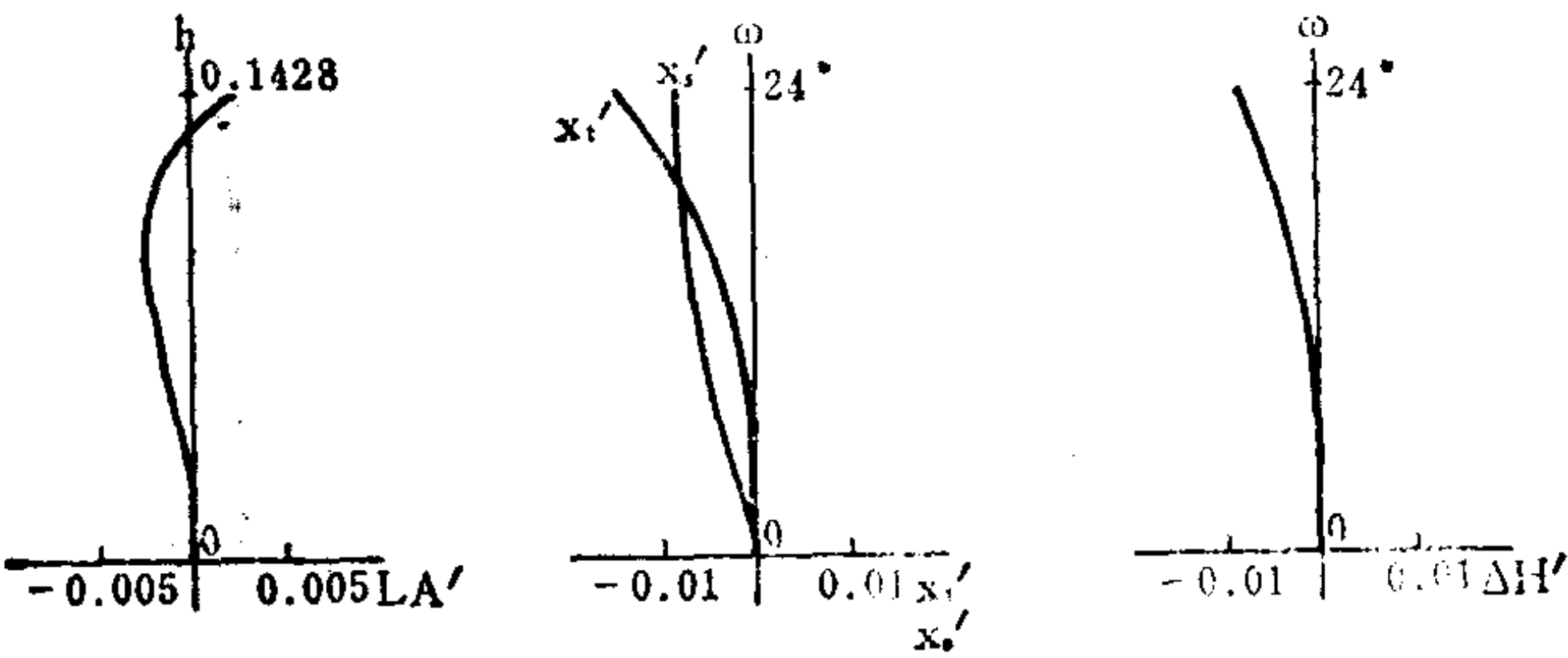
F.A.=±24°



序号	r	d	n	v	序号	r	d	n	v
1	0.4254	0.136	1.71300	53.9	5	-3.0150	0.050	1.51118	50.9
2	-1.3100	0.016			6	0.4065	0.142	1.65160	58.5
3	-0.6766	0.050	1.59551	39.0	7	-0.5400			
4	0.3070	0.085*							

0.085* = 0.045 + 0.040

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.000397	0.000516	0.000128	-0.000963	-0.001662	0.44	-1.9%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.00263	-0.00868	-0.01514	-0.00793	-0.00721	0.13739	-0.00205
70	-0.00230	-0.00266	-0.00478	-0.00750	0.00272	-0.00383	0.00001



编号: 07-04-085

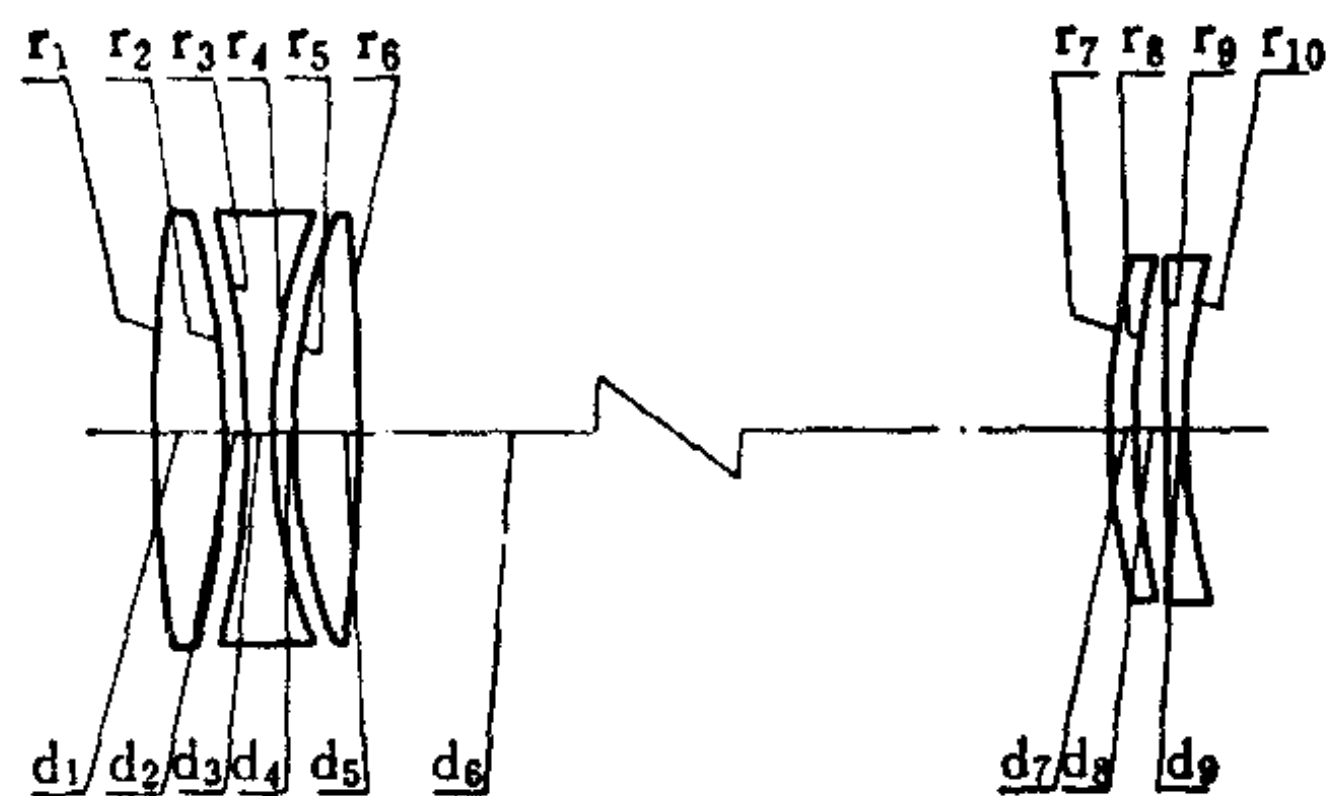
超 远 摄 物 镜

E.F.L=48.15

B.F.L=6.83

FNo.=11

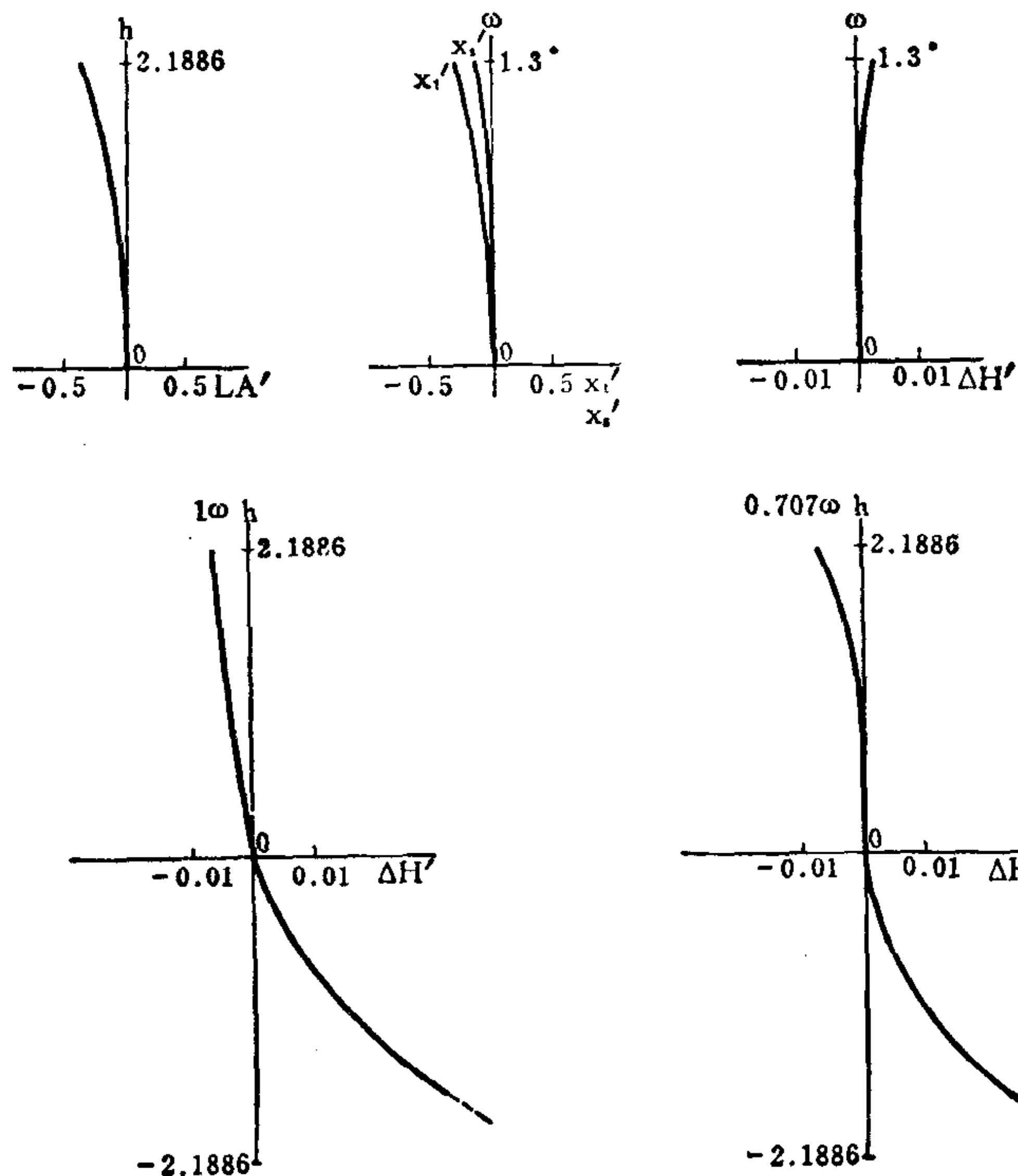
F.A.=±1.3°



序号	r	d	n	v	序号	r	d	n	v
1	38.079	1.351	1.6180	63.38	6	-113.167	33.162*		
2	-22.975	0.014			7	23.928	0.299	1.6990	30.10
3	-28.811	0.800	1.7552	27.50	8	65.522	0.050		
4	12.937	0.209			9	∞	0.370	1.5687	63.10
5	13.323	1.325	1.7847	25.60	10	11.799			

33.162* = 17.000 + 16.162

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1ω)
	-0.001419	0.000638	-0.000386	0.000011	0.000265	1	0.27%
h 或 ω %	LA'	ΔH'	x _t '	x _s '	x _t ' - x _s '	K _{T1} '	K _{T0.7} '
100	-0.346	0.0029	-0.276	-0.091	-0.185	0.02236	0.01095
70	-0.172	0.0010	-0.138	-0.045	-0.093	0.01564	0.00766



编号: 07-04-086

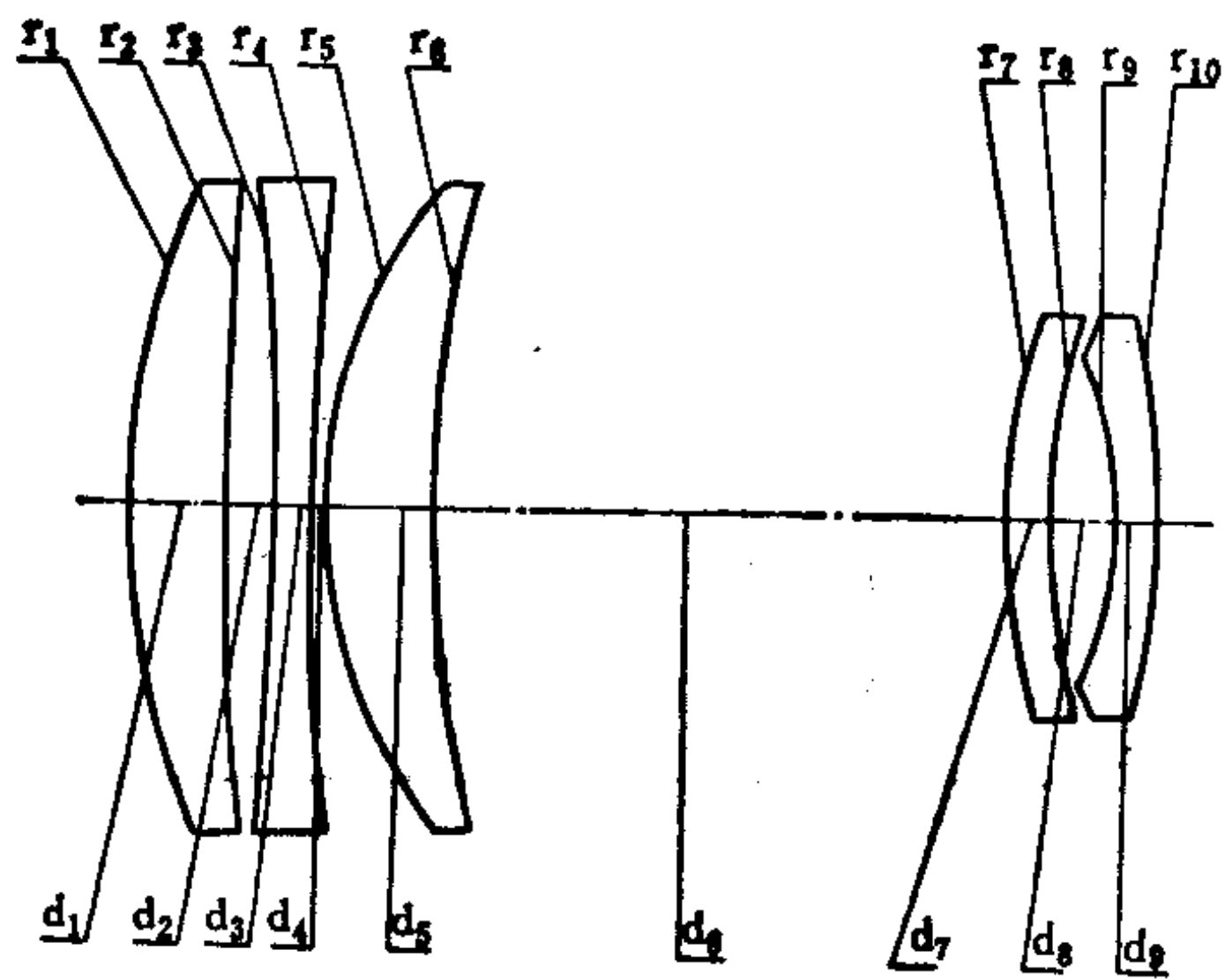
小型远摄物镜

E.F.L=99.98

B.F.L=40.30

FNo.=3.5

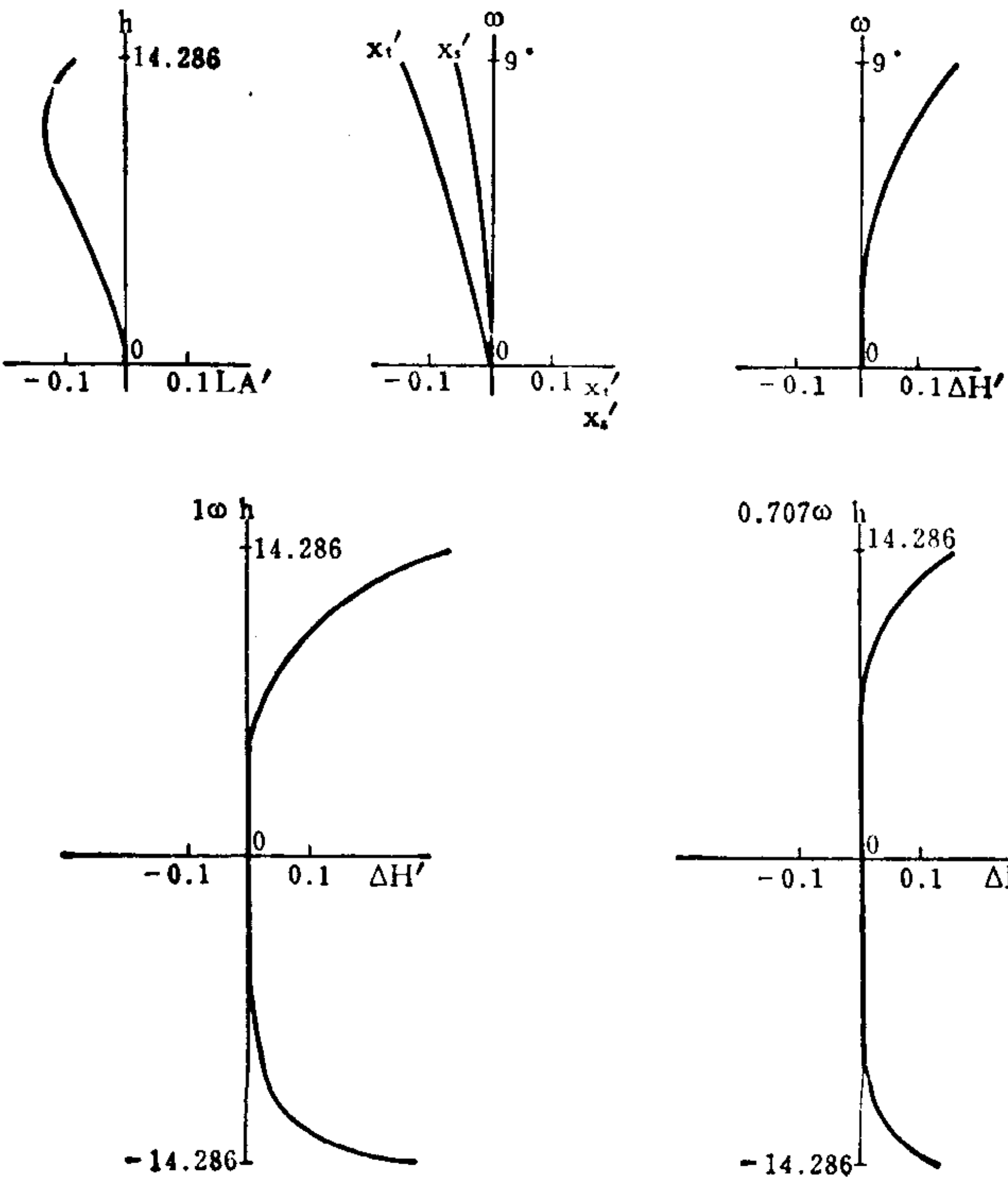
F.A.=±9°



序号	r	d	n	v	序号	r	d	n	v
1	35.11	4.19	1.51633	64.1	6	49.51	23.44*		
2	308.89	1.81			7	26.73	1.93	1.72825	28.5
3	-130.89	1.33	1.78470	26.2	8	47.51	2.48		
4	120.83	0.08			9	-15.46	0.90	1.64000	60.2
5	20.95	4.61	1.51821	65.0	10	-52.20			

23.44* = 12.00 + 11.44

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.01861	-0.00875	-0.00347	-0.00062	0.04974	15.8	1%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.0819	0.164	-0.148	-0.059	-0.089	0.3104	0.0579
70	-0.1269	0.060	-0.104	-0.040	-0.064	0.1433	0.0129



编号: 07-04-087

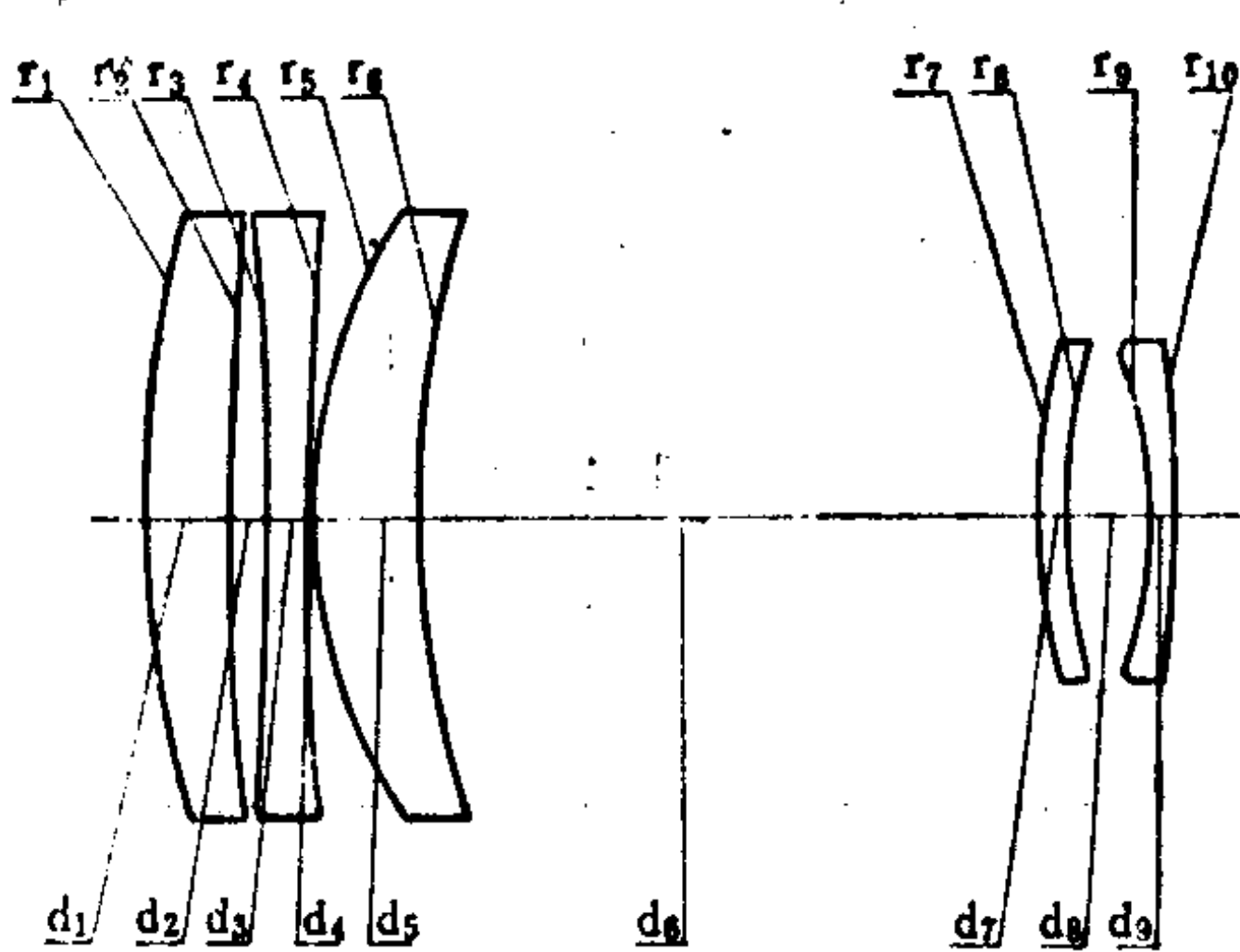
小型远摄物镜

E.F.L=100

B.F.L=40.38

FNo.=3.5

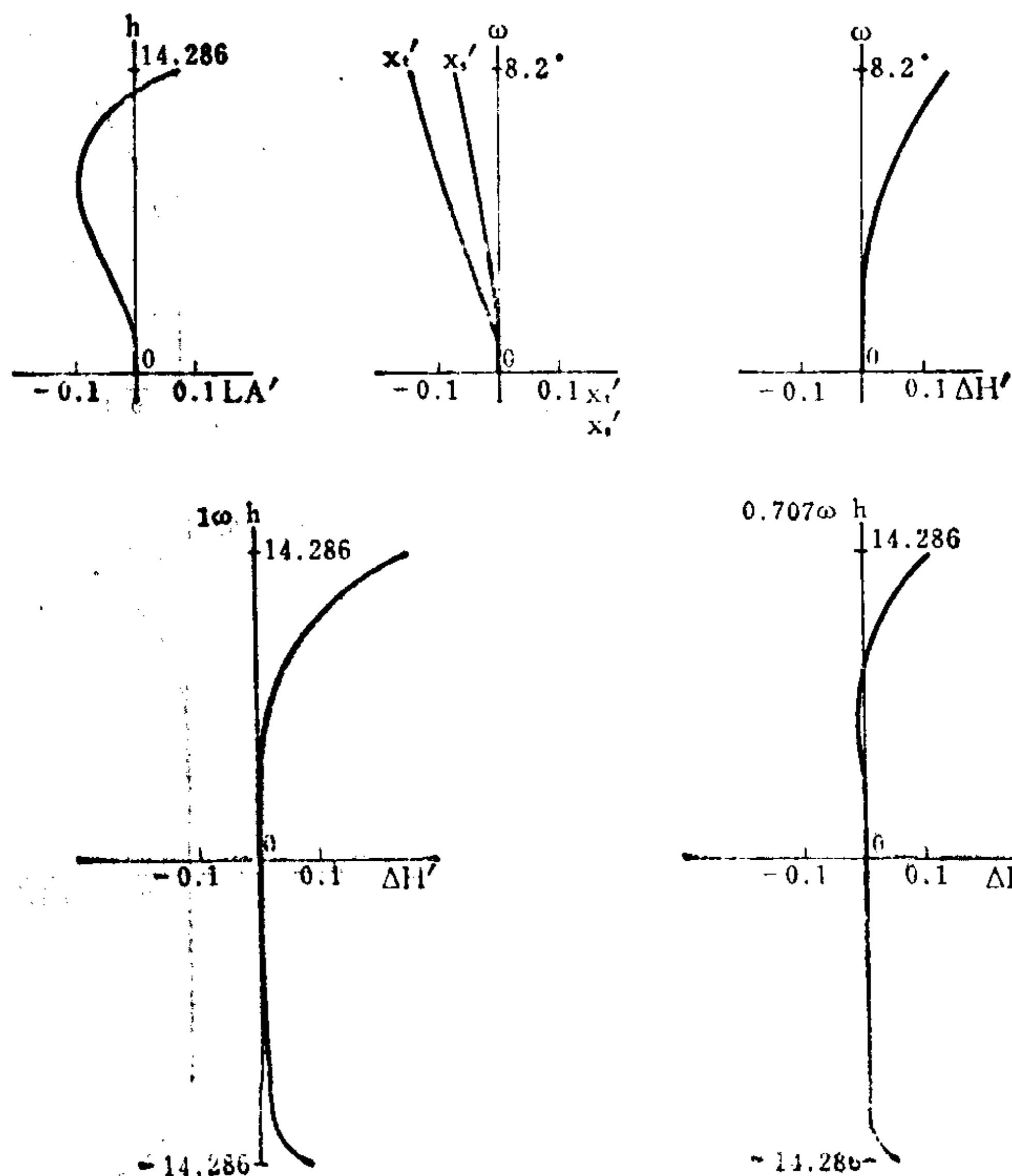
F.A.=±8.2°



序号	r	d	n	v	序号	r	d	n	v
1	33.81	3.54	1.51112	60.5	6	45.19	23.99*		
2	428.55	1.41			7	27.41	1.21	1.72825	28.5
3	-145.86	1.33	1.80518	25.4	8	55.22	2.72		
4	118.64	0.07			9	-15.87	0.80	1.65160	58.6
5	20.57	3.87	1.51633	64.1	10	-67.11			

$$23.99^* = 12.00 + 11.99$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.01688	-0.00577	-0.00352	-0.00073	0.04176	14.4	0.98%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.0786	0.142	-0.152	-0.070	-0.082	0.1697	0.0392
70	-0.0931	0.051	-0.107	-0.044	-0.063	0.0709	0.0060



编号: 07-04-088

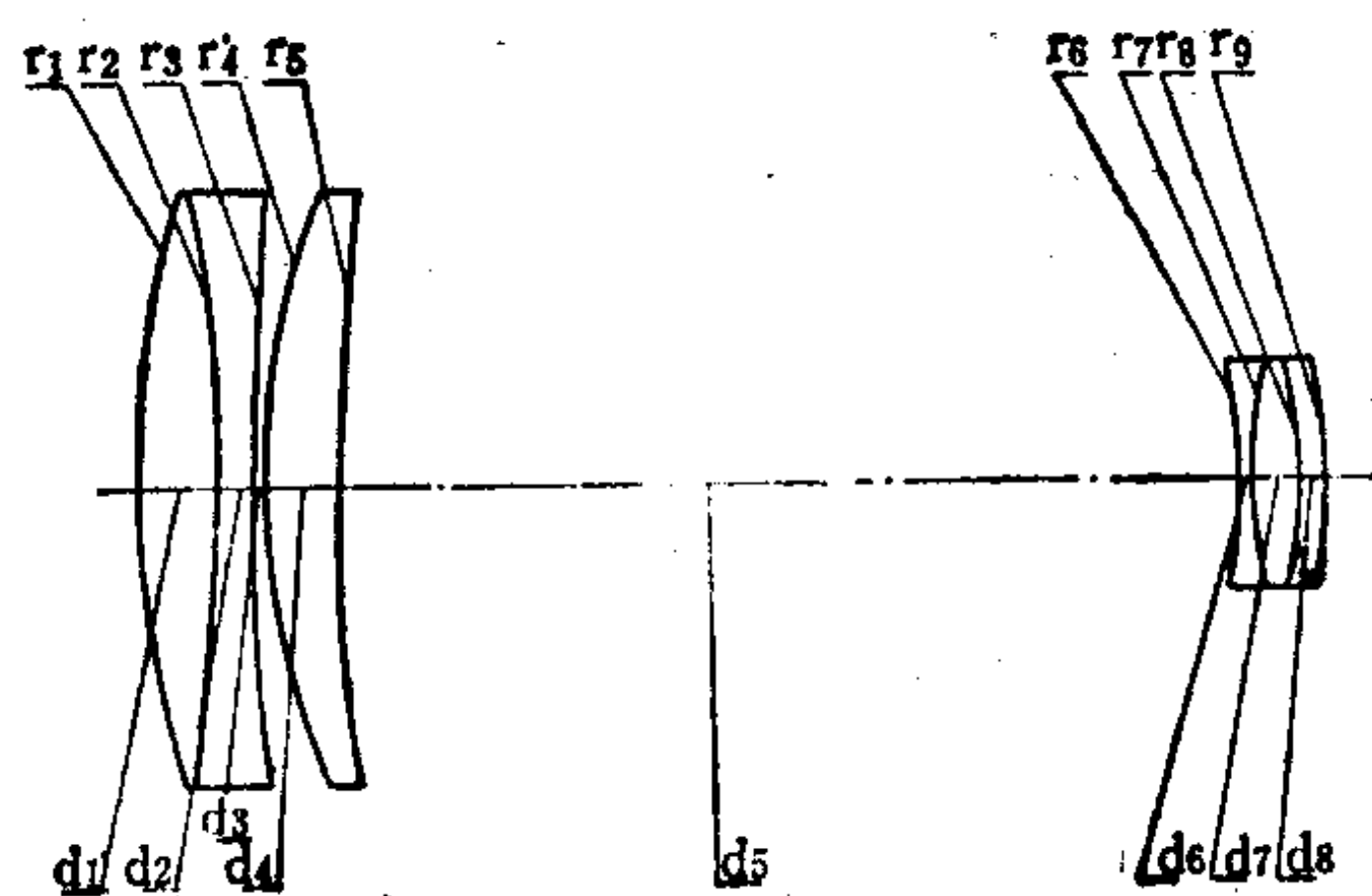
短的远摄物镜

E.F.L=1

B.F.L=0.2707

FNo.=5.6

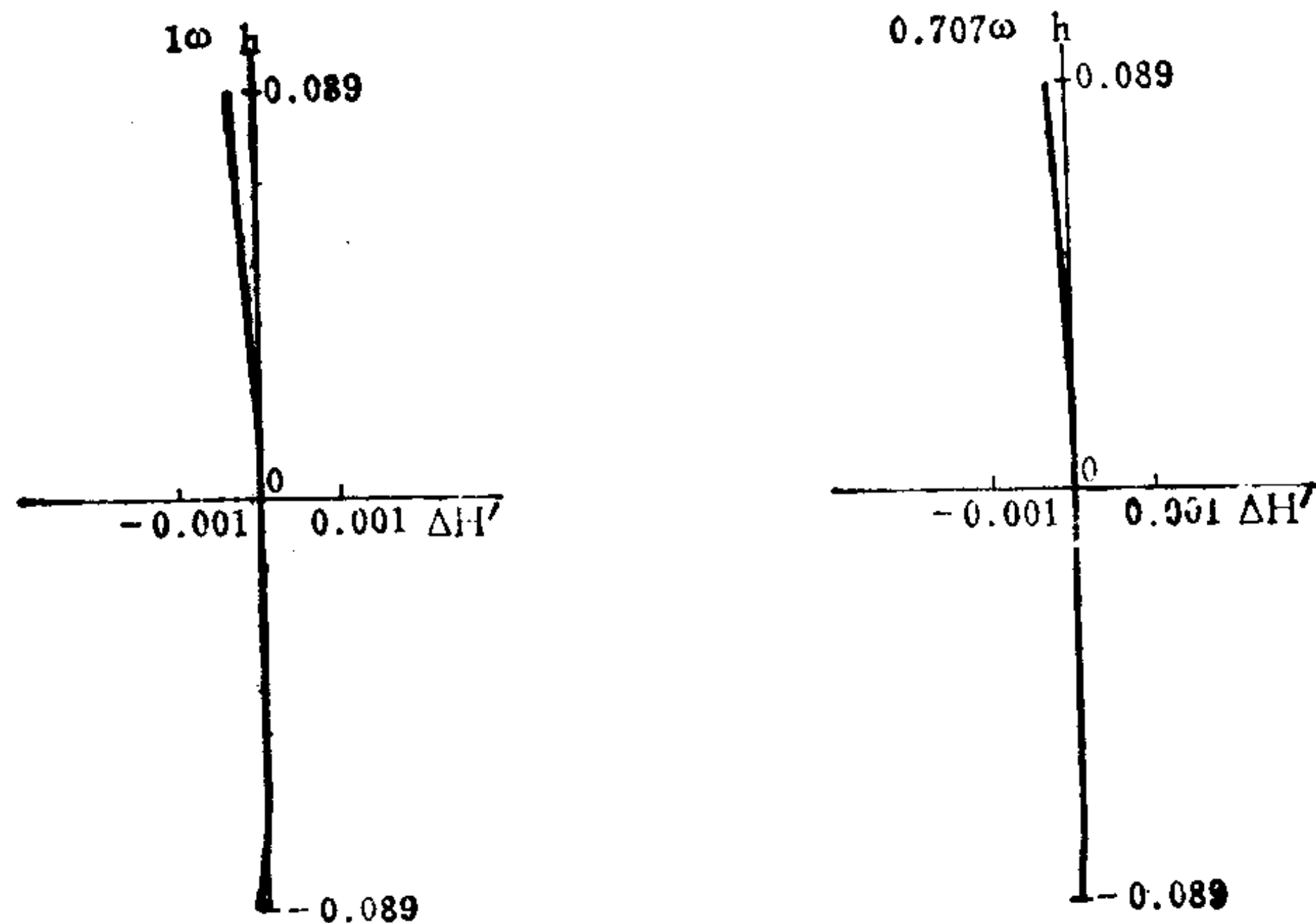
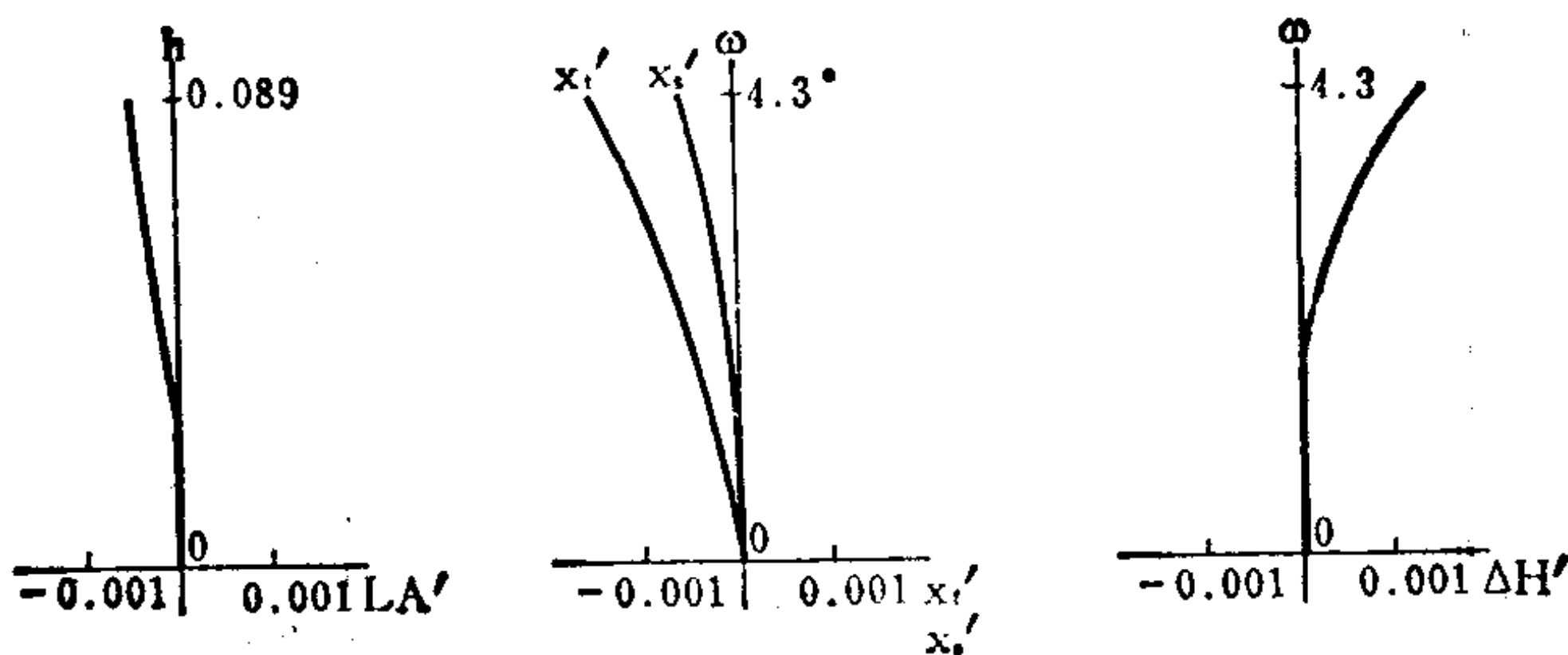
F.A.=±4.3°



序号	r	d	n	v	序号	r	d	n	v
1	0.38316	0.0258	1.48749	70.4	6	-0.16392	0.0041	1.80420	46.5
2	-0.50344	0.0094	1.68893	31.2	7	0.16392	0.0127	1.59270	35.5
3	2.90232	0.0010			8	-0.08591	0.0045	1.77250	49.6
4	0.22199	0.0245	1.48749	70.4	9	-0.19430			
5	0.77167	0.2955*							

0.2955* = 0.1500 + 0.1455

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1ω)
	-0.000010	-0.000004	-0.000012	0.000002	0.000218	0.075	1.7%
h 或 ω %	LA'	ΔH'	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00046	0.00128	-0.00162	-0.00056	-0.00106	-0.000127	-0.000071
70	-0.00027	0.00044	-0.00093	-0.00028	-0.00065	-0.000054	-0.000034



编号: 07-04-089

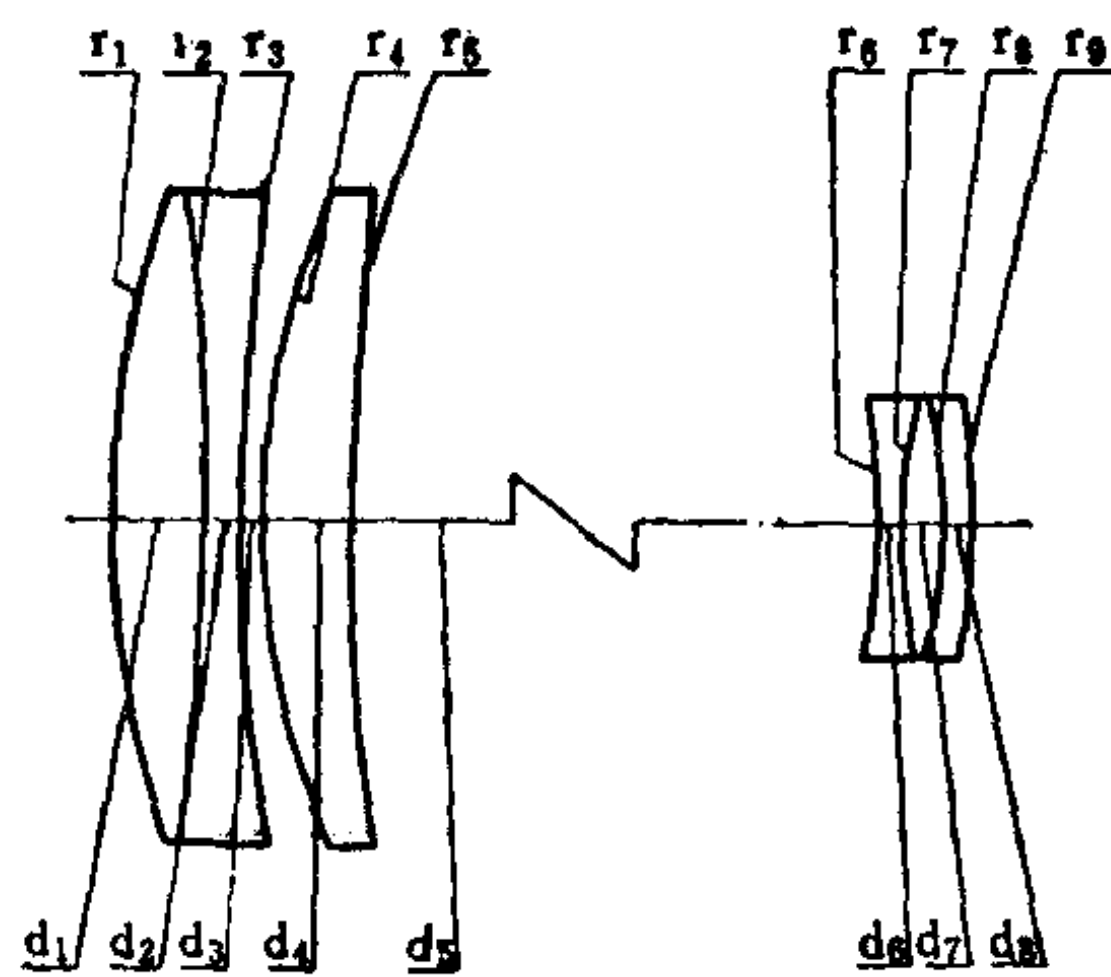
短的远摄物镜

E.F.L=1

B.F.L=0.2505

FNo.=5.6

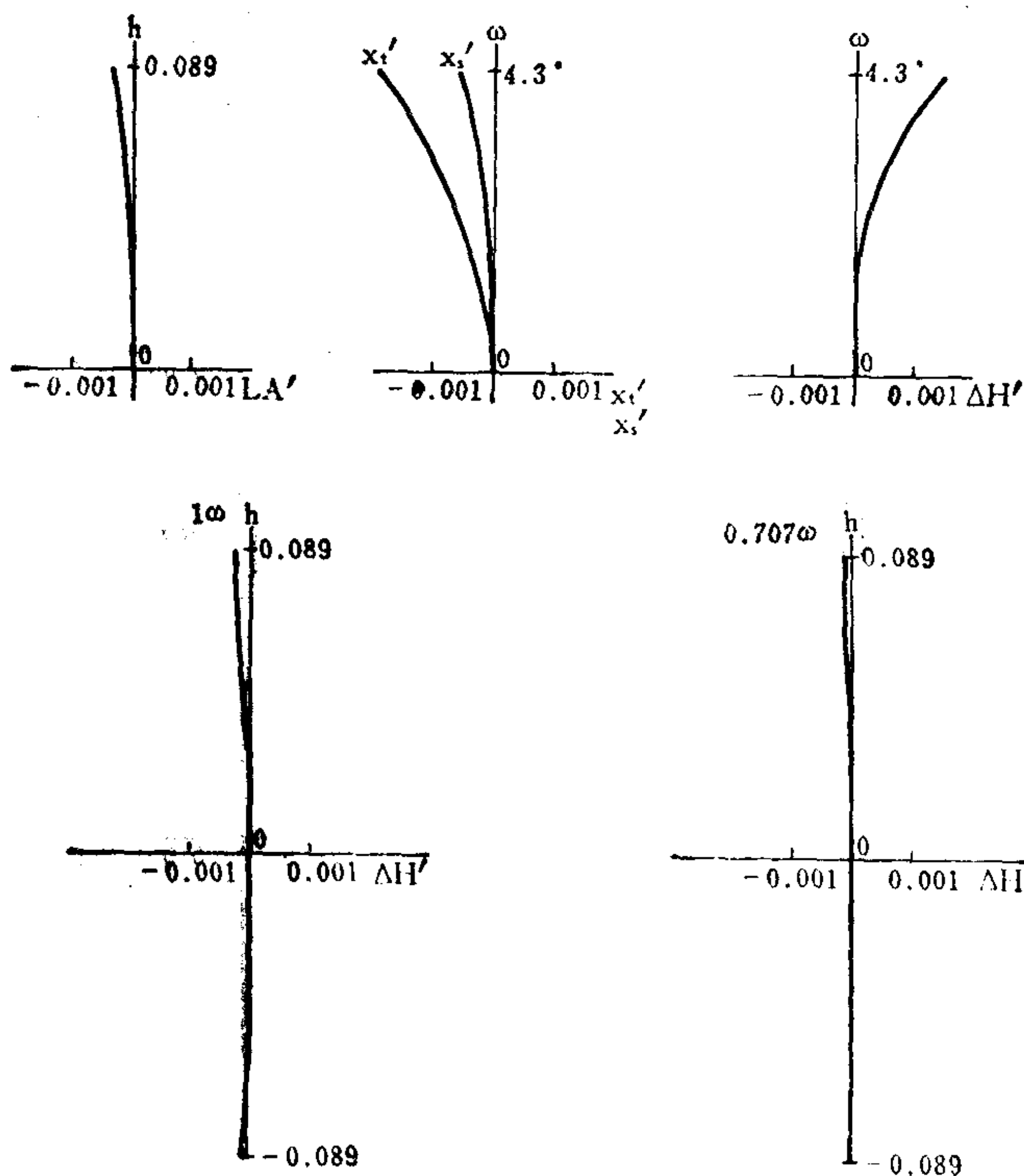
F.A.=±4.3°



序号	r	d	n	v	序号	r	d	n	v
1	0.36804	0.0258	1.48749	70.4	6	-0.16151	0.0041	1.81600	46.8
2	-0.52062	0.0094	1.75690	31.8	7	0.17148	0.0127	1.59340	34.8
3	3.70050	0.0010			8	-0.08351	0.0045	1.78800	47.5
4	0.23247	0.0245	1.48749	70.4	9	-0.19390			
5	0.97670	0.3058*							

0.3058* = 0.1500 + 0.1558

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.000006	-0.000003	-0.000014	0.000005	0.000237	0.075	1.8%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	-0.00037	0.00139	-0.00196	-0.00055	-0.00141	-0.000152	-0.000081
70	-0.00018	0.00048	-0.00108	-0.00027	-0.00081	-0.000063	-0.000037



编号: 07-04-090

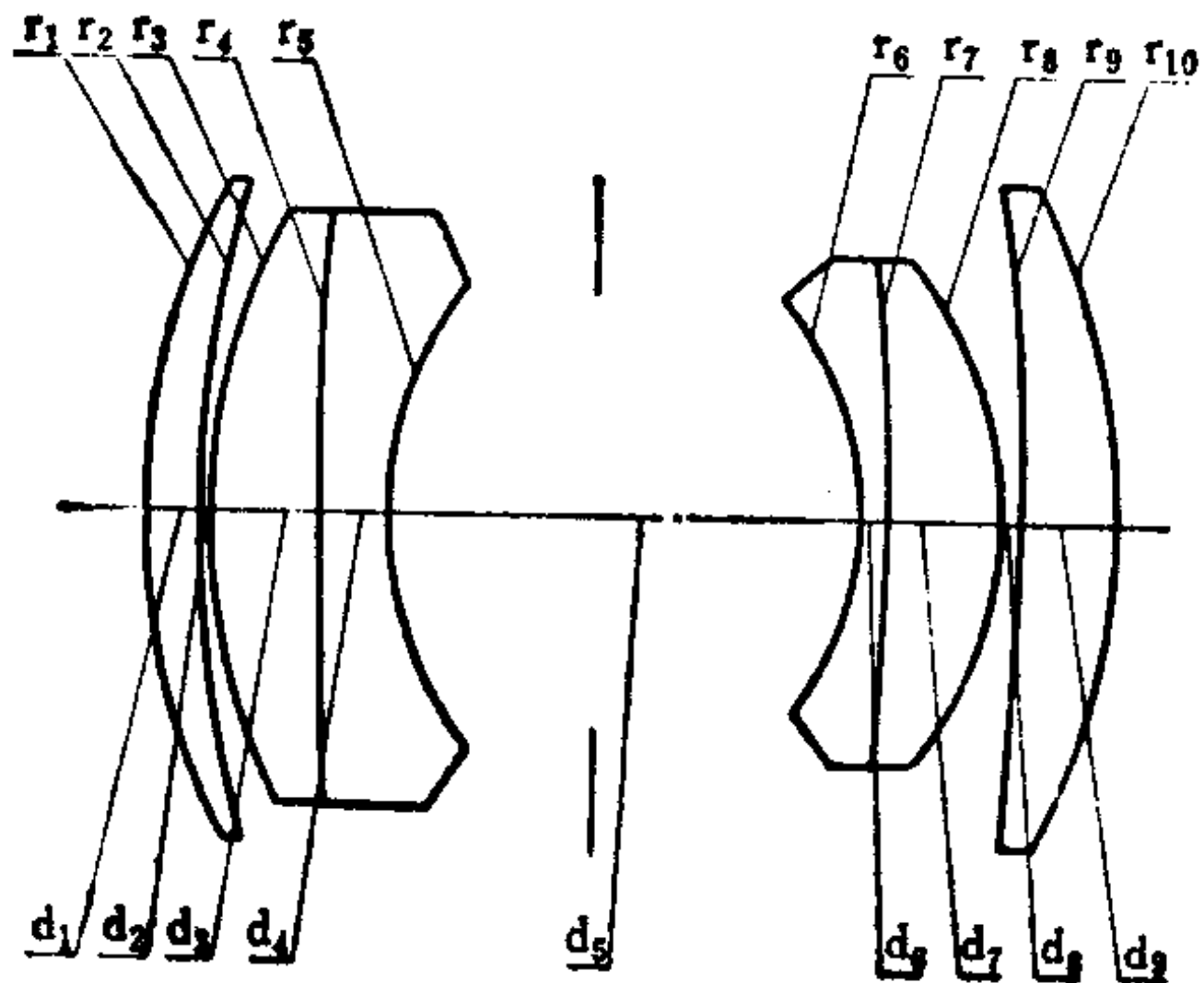
高斯型物镜

E.F.L=98.78

B.F.L=72.09

FNo.=3.46

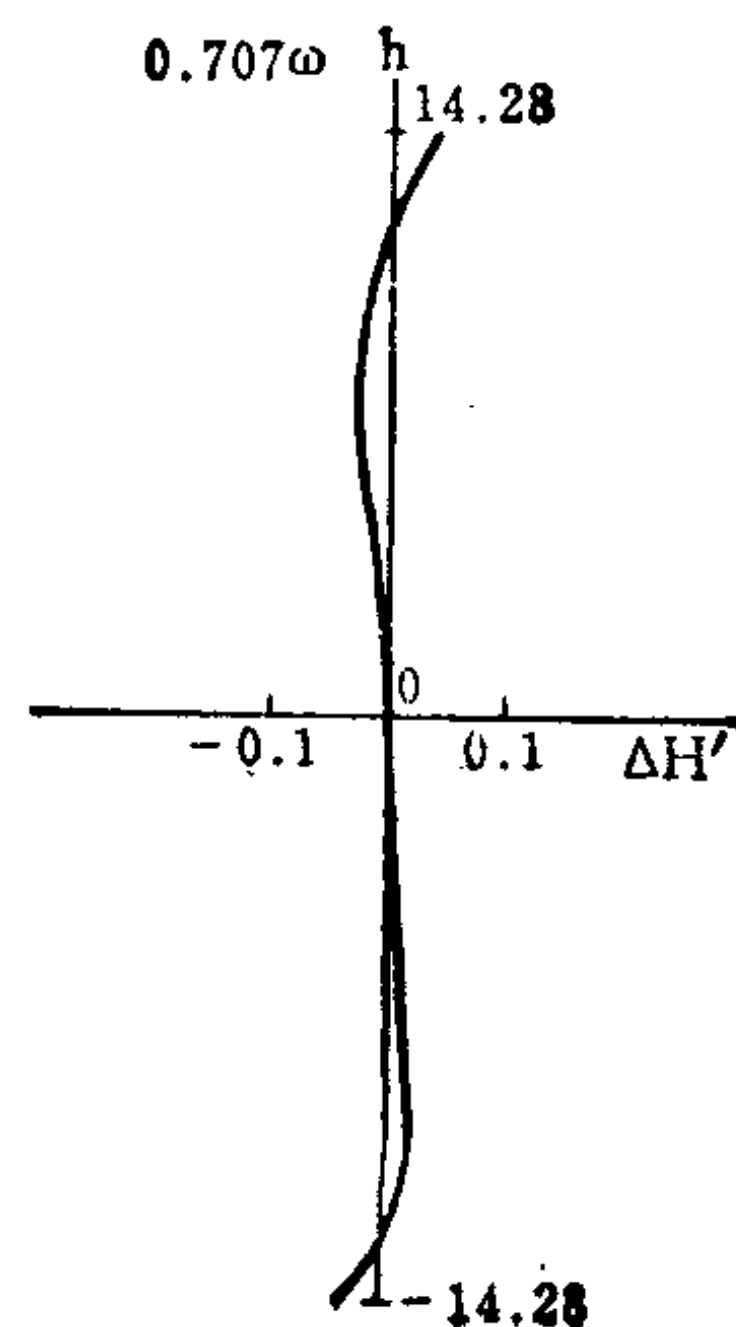
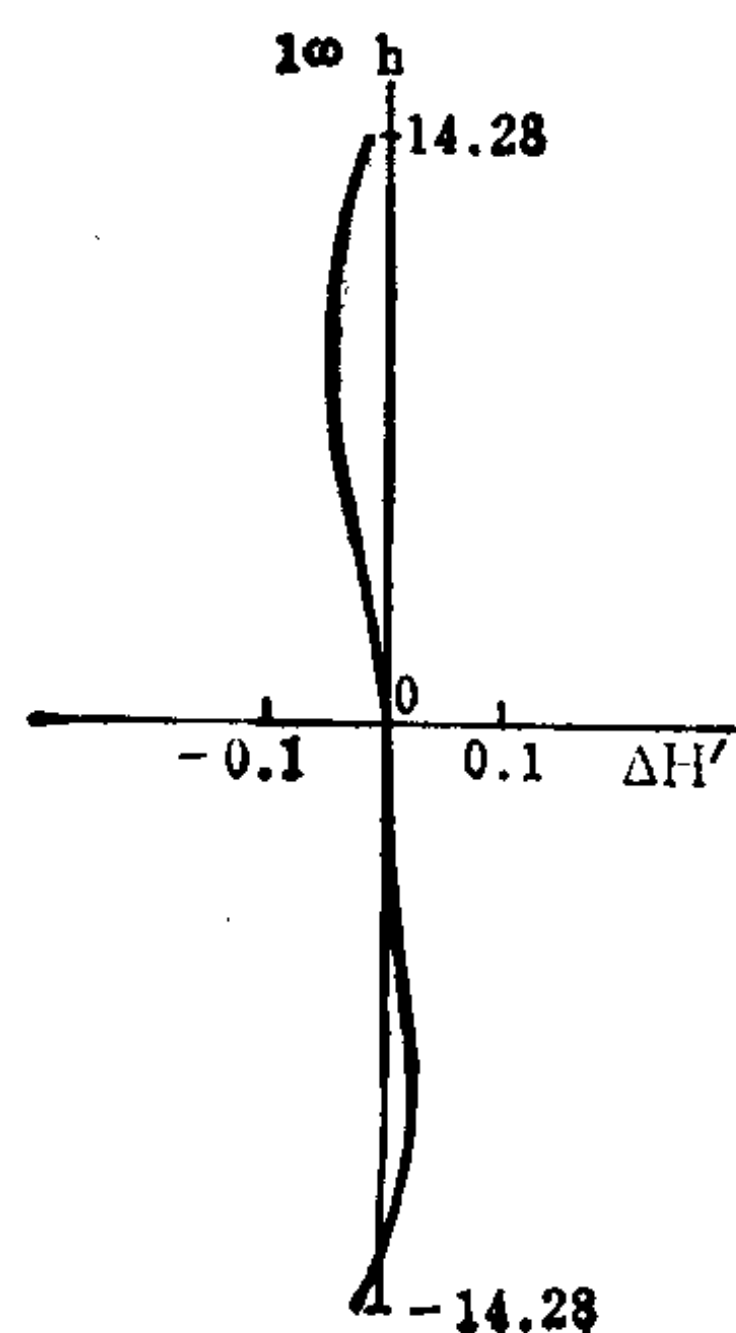
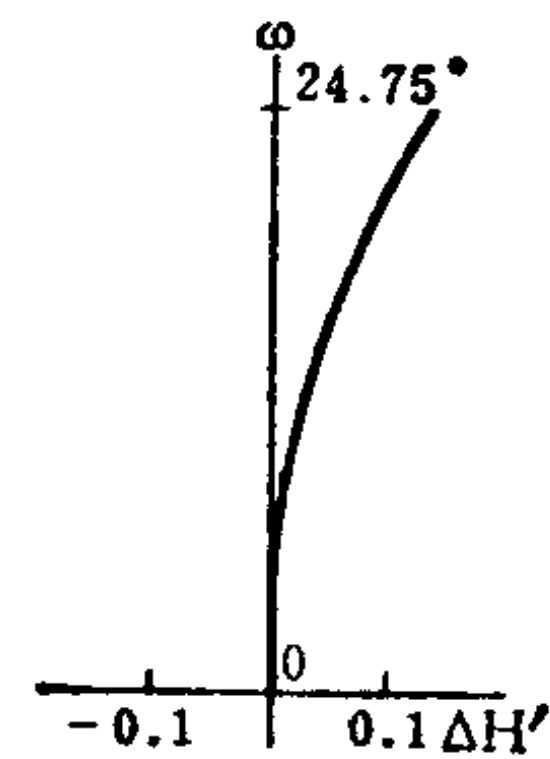
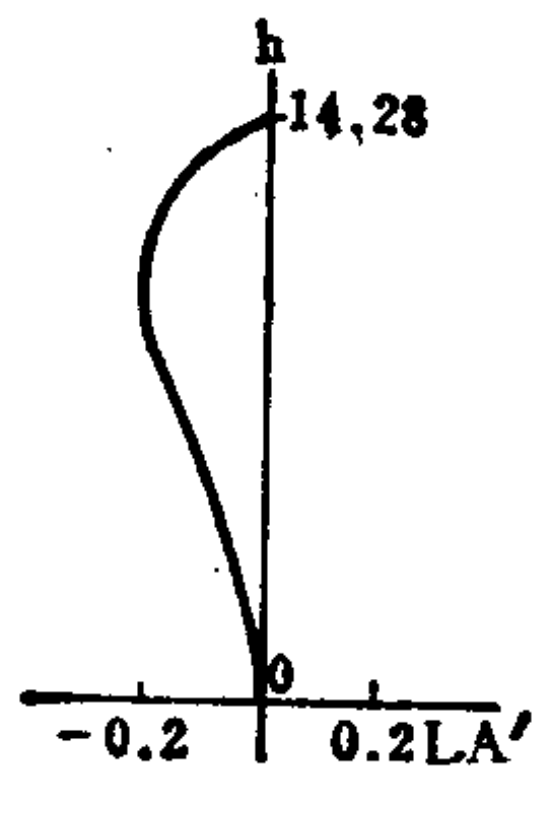
F.A.=±24.75°



序号	r	d	n	v	序号	r	d	n	v
1	39.575	5.34	1.71300	53.9	6	-19.270	1.21	1.74950	35.1
2	81.415	0.21			7	-273.960	6.50	1.62012	49.6
3	37.442	6.38	1.72000	43.7	8	-24.243	0.20		
4	143.390	3.98	1.64769	33.8	9	-232.870	5.99	1.71700	47.9
5	22.470	27.42*			10	-40.403			

27.42* = 14.00 + 13.42

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	-0.0304	0.0017	0.0062	-0.0421	0.0485	45.5	0.3%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{11}	$K'_{T0.7}$
100	0.0054	0.143	-0.397	-0.235	-0.162	-0.02015	-0.01811
70	-0.2072	0.059	-0.219	-0.288	0.069	0.00353	-0.00216



编号: 07-04-091

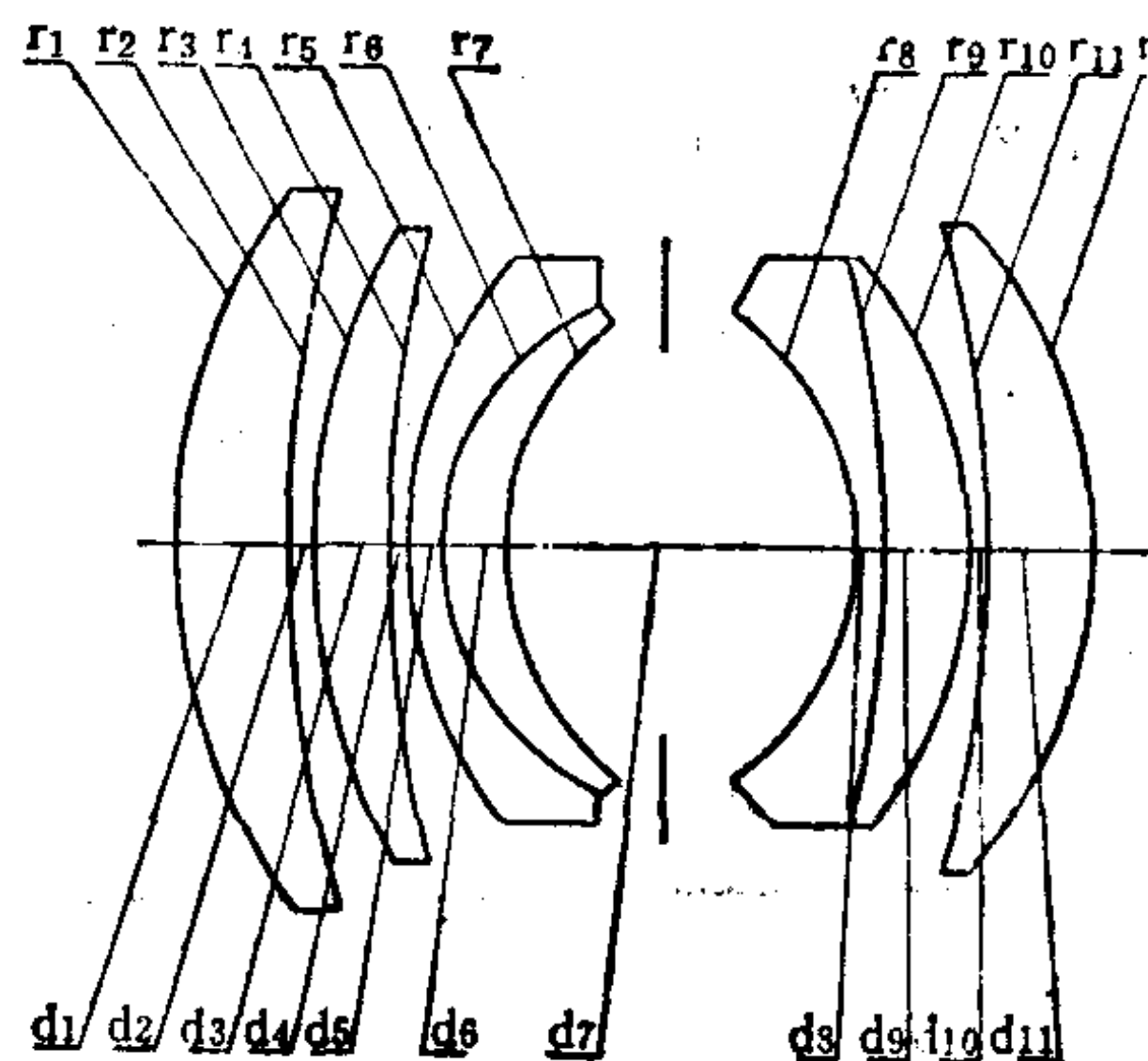
高斯型放大制版物镜

E.F.L=100

B.F.L=59

FNo.=3.5

F.A.=±25°



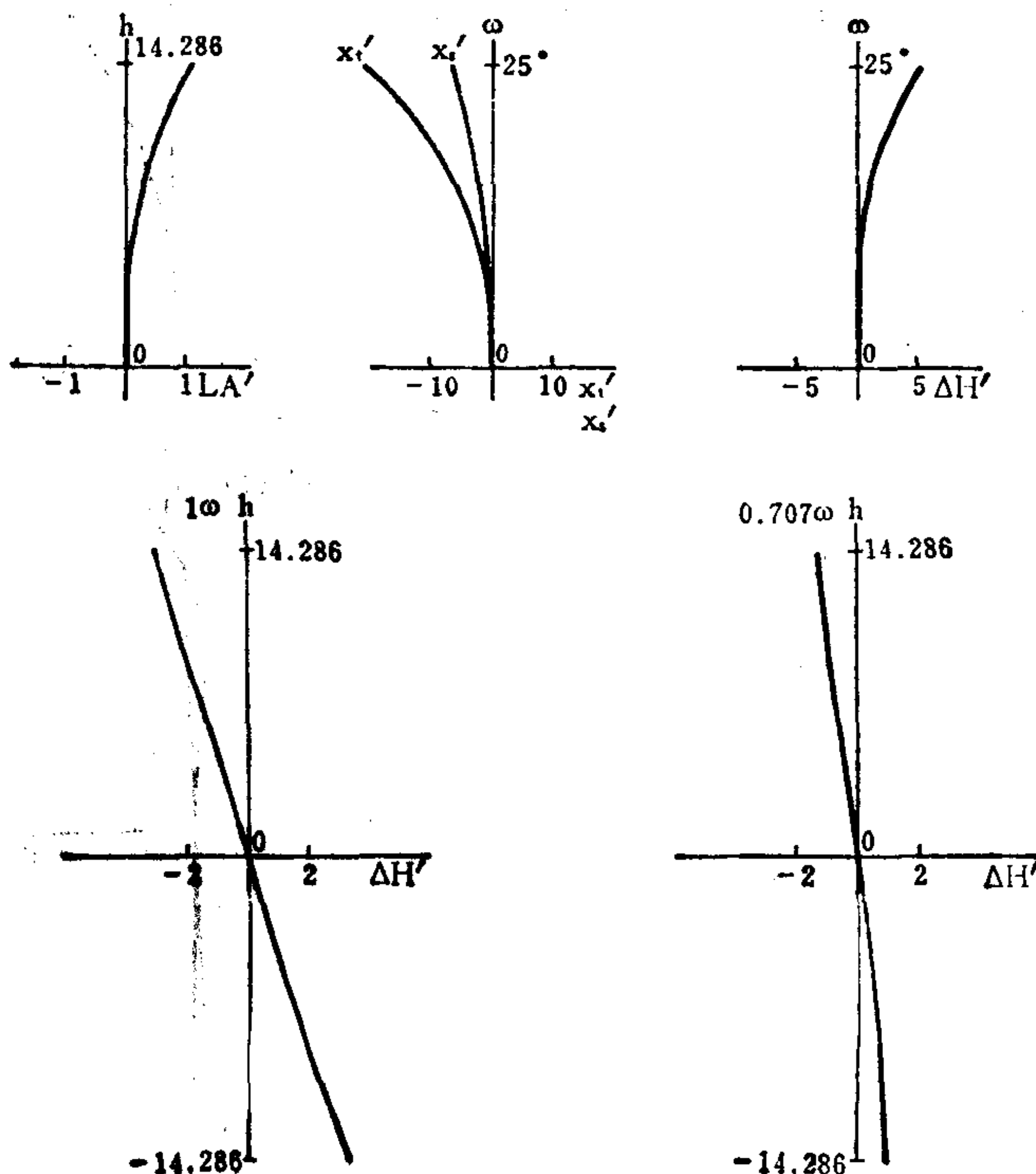
序号	r	d	n	v	序号	r	d	n	v
1	42.015	8.00	1.5687	63.2	7	19.960	23.67*		
2	90.339	1.33			8	-19.456	2.00	1.7400	31.7
3	47.244	5.67	1.5687	63.2	9	-100.159	6.67	1.6860	49.2
4	97.570	0.40			10	-29.407	0.27		
5	31.282	2.27	1.5927	35.3	11	-82.624	7.47	1.7570	47.9
6	18.893	3.87	1.6700	57.3	12	-35.199			

23.67* = 12.00 + 11.67

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	0.0272	-0.0542	-0.1476	-0.0399	0.9008	46.7	10.3%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{t1}	$K'_{t0.7}$
100	1.0748	4.810	-22.122	-6.292	-15.830	0.2104	0.0655
70	0.4259	1.319	-8.677	-2.886	-5.791	-0.2093	-0.1090

注: 1. 以上象差值是按 $l = -\infty$, $d_2 = 1.33$ 计算的。

2. $M = 4\times$ (NA = 0.029, $d_2 = 1.33$) $\sim 8\times$ ($d_2 = 0.20$)。



编号: 07-04-092

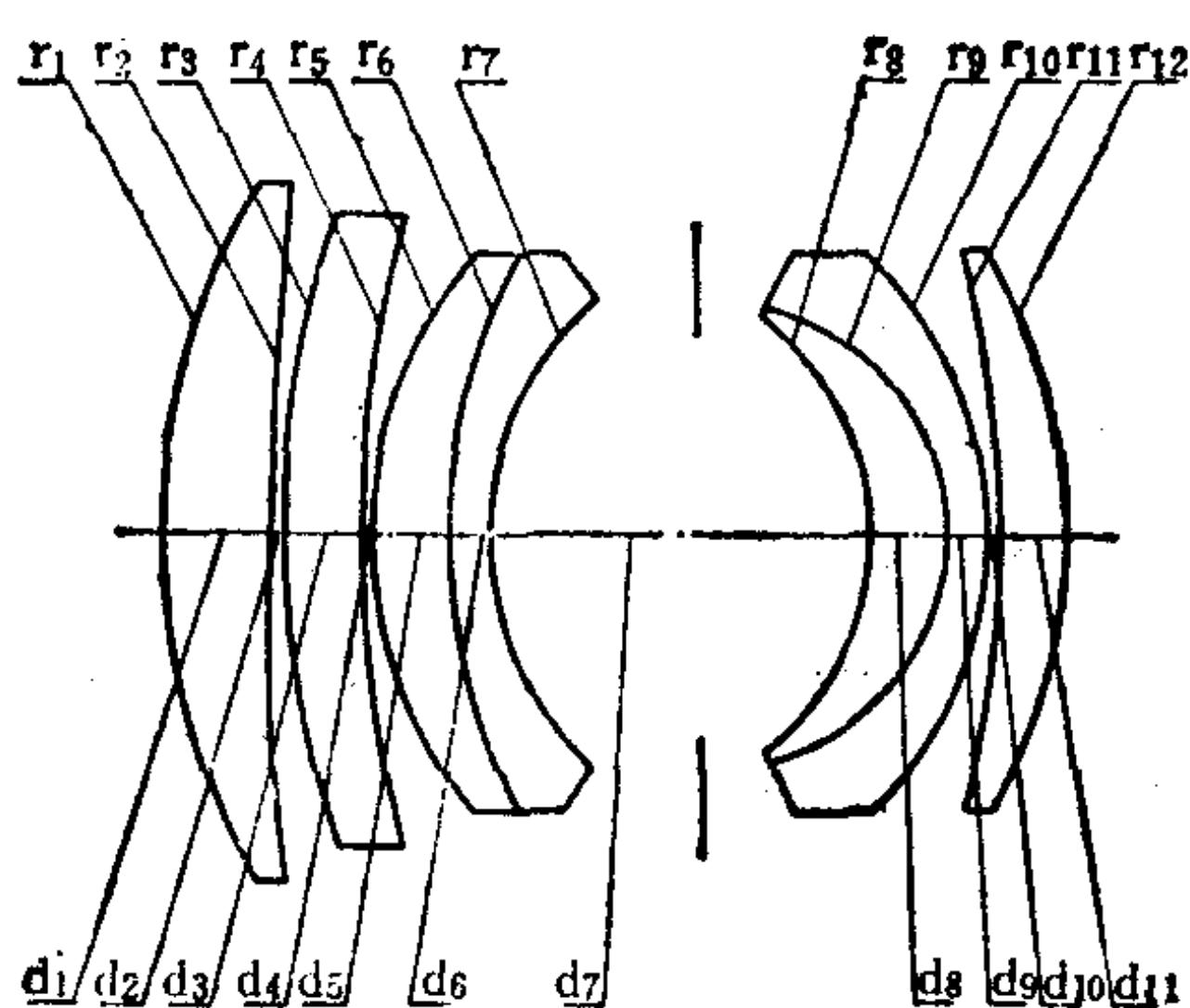
高斯型放大制版物镜

E.F.L=100

B.F.L=59.6

FNo.=3.5

F.A.=±25°



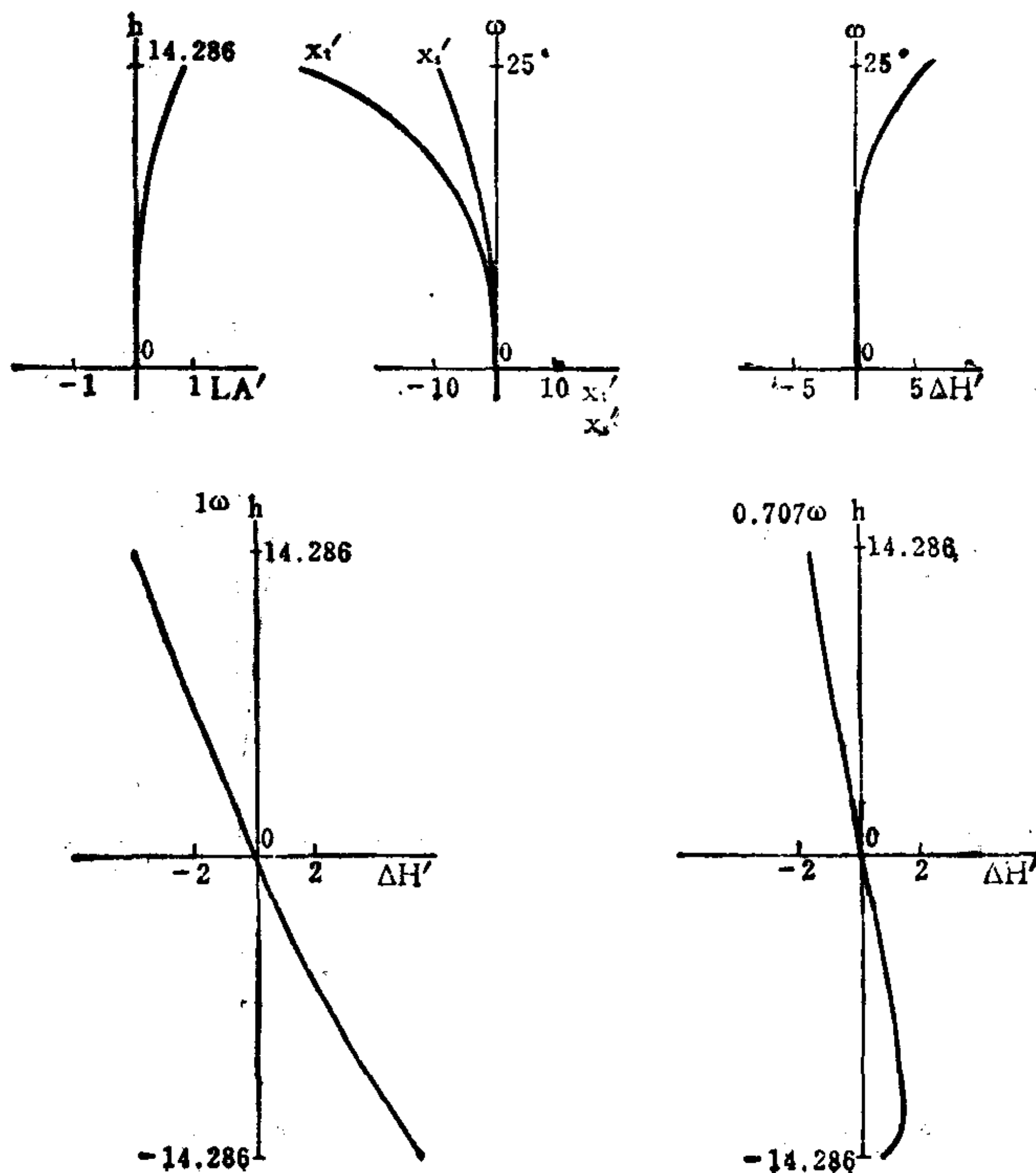
序号	r	d	n	v	序号	r	d	n	v
1	53.068	6.750	1.6584	50.9	7	22.441	26.326*		
2	273.055	0.338			8	-19.531	5.400	1.6400	60.3
3	65.320	5.400	1.6584	50.9	9	-16.537	2.363	1.5927	35.3
4	68.942	0.338			10	-28.173	0.338		
5	31.127	5.400	1.6700	57.3	11	-90.903	8.775	1.7432	49.4
6	44.587	2.700	1.7408	27.8	12	-39.143			

26.326* = 14.000 + 12.326

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	0.0196	-0.0430	-0.1777	-0.0489	1.1137	46.6	13.8%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{10.7}$
100	0.8318	6.436	-32.568	-8.513	-24.055	0.7829	0.3537
70	0.3197	1.587	-11.143	-3.615	-7.528	-0.4373	-0.0239

注: 1. 以上象差值是按 $l = -\infty$ 、 $d_2 = 0.338$ 计算的。

2. 改变 d_2 , 实现 $M = 4^*$ ($NA = 0.029$) $\sim 8^*$ 。



编号: 07-04-093

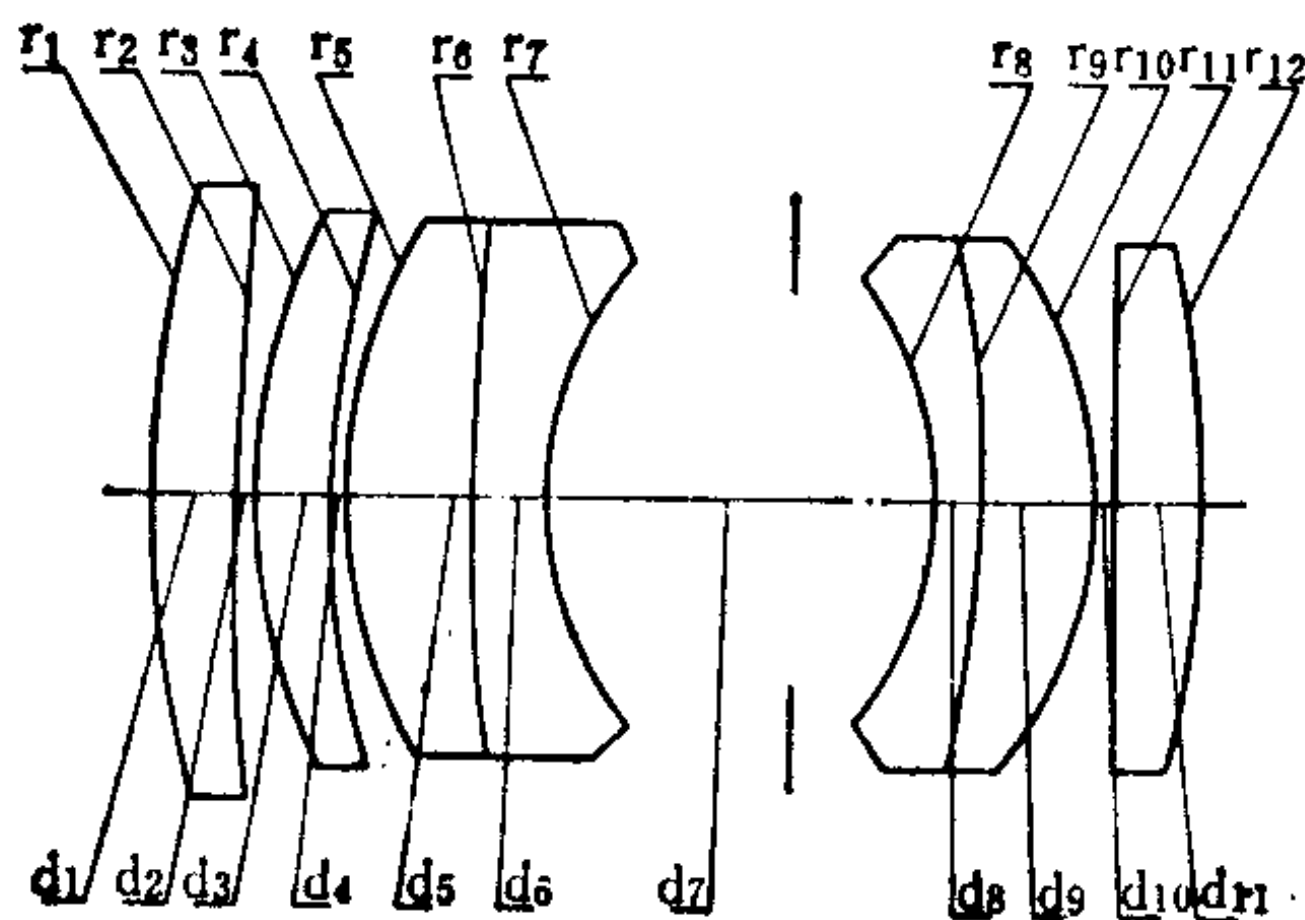
精 缩 镜 头

E.F.L=1

B.F.L=0.5925

FNo.=4

F.A. = $\pm 20^{\circ}$ **



序号	r	d	n	v	序号	r	d	n	v
1	0.9668	0.0587	1.73740	51.45	7	0.2365	0.2847*		
2	1.3048	0.0016			8	-0.2340	0.0333	1.67158	33.04
3	0.4666	0.0587	1.73740	51.45	9	-0.8524	0.0754	1.73740	51.45
4	0.8057	0.0015			10	-0.3125	0.0110		
5	0.4029	0.0924	1.73740	51.45	11	∞	0.0654	1.73740	51.45
6	1.5107	0.0414	1.65223	33.80	12	-0.7376			

$$0.2847^* = 0.1424 + 0.1423$$

	ΣS_1	ΣS_2	ΣS_3	ΣS_4	ΣS_5	HI	QP(1 ω)
	0.000004	-0.000075	-0.000033	-0.000093	0.000847	0.36	0.89%
h 或 ω %	LA'	$\Delta H'$	x'_t	x'_s	$x'_t - x'_s$	K'_{T1}	$K'_{T0.7}$
100	0.00110	0.00326	-0.00089	0.00202	-0.00291	-0.000975	-0.000486
70	0.00030	0.00121	-0.00230	-0.00080	-0.00150	-0.000689	-0.000337

注: 1. 以上象差值是按 $l = -\infty$ 计算的。

2. 在 $M = (1/7) \times (E.F.L = 120)$ 时, 分辨率为 350 线对/毫米。

